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THE FECUNDITY OF THE NATIVE AND
FOREIGN BORN POPULATION IN
MASSACHUSETTS.*

II.

FECUNDITY AND MORTALITY.

III. FECUNDITY.

1. *Births.*

THE following study will, as indicated before, embrace the births in the fifteen years from 1883 to 1897. Table XVII. gives the births by parentage for the fifteen years and the three quinquennial periods.

* *Errata.*—In Part I. of this article printed in this Journal for November, 1901, on page 7 under "Ireland, increase in per cent., 1890-95," read $-.6$ instead of $.6$; on page 15, line 25, read 1893-97 instead of 1883-97; on page 24 read married 1887-89 instead of married 1887-99; on page 31, under "Foreign males, not married, age unknown," read 449 instead of 944; "Native females married, percentage, 20-29 years," read 39.19 instead of 60.81, the same not married read 60.81 instead of 39.19.

TABLE XVII.
NUMBER OF BIRTHS EXHIBITING THE PARENTAGE, 1883-1897.†

YEAR.	Total.	Native.	Foreign.	Native father. Foreign mother.	Foreign father. Native mother.	Not stated.
1883	47,285	18,412	19,188	3,771	4,398	1,516
1884	48,615	18,734	19,750	4,058	4,613	1,460
1885	48,790	18,822	19,733	4,295	4,577	1,363
1886	50,788	19,531	20,758	4,518	4,781	1,200
1887	53,174	20,207	22,781	4,853	5,025	308
1888	54,893	20,078	22,990	5,771	5,784	270
1889	57,075	20,260	24,760	5,913	5,850	292
1890	57,777	20,023	25,361	6,160	5,961	272
1891	63,004	21,325	28,097	6,685	6,545	352
1892	65,824	21,800	29,895	6,919	6,767	443
1893	67,192	21,788	31,448	7,003	6,666	287
1894	66,936	21,718	31,008	7,107	6,833	270
1895	67,545	21,851	31,628	7,026	6,821	219
1896	72,343	22,810	34,237	7,792	7,241	263
1897	73,205	23,824	35,256	7,152	6,766	207
1883- 1887	248,652	95,706	102,210	21,495	23,394	5,847
1888- 1892	298,573	103,486	131,103	31,448	30,907	1,629
1893- 1897	347,221	111,991	163,577	36,080	34,327	1,246

In order to gain a preliminary view of the general fecundity* of the native and foreign born population, it will be useful to compare the births of native parentage with the whole native population, those of foreign parentage with the entire foreign born population. The births of mixed parentage will be treated half as native, half as foreign born. The children whose parentage was unknown are distributed between the births of native and foreign parentage in the proportion of the cases known. In Table XVIII. the births of native and foreign parentage in the annual average of the three quinquennial

† *Registration Report*, vol. lvi. p. 129.

* In the following pages the term "fecundity" does not refer to any total physiological capability to bear children, but only to that part of such ability which finds expression in births. Barrenness, then, does not mean inability to bear children, but the fact of childlessness.

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periods are compared with the population found at the three censuses as given in Table III.

TABLE XVIII.

GENERAL BIRTH-RATES OF THE NATIVES AND FOREIGN BORN.

PARENTAGE.	Births.			Annual birth-rate.		
	1883-87.	1888-92.	1893-97.	1883-87.	1888-92.	1893-97.
Native . . .	120,996	135,402	147,725	17.10	17.12	17.03
Foreign . .	127,656	163,171	199,496	48.46	49.66	52.16
State . . .	248,652	298,573	347,221	25.61	26.67	27.78

The birth-rate of the foreign born appears three times as large as that of the natives. While the general birth-rate of the total population shows a small increase from period to period, this cannot be said for the natives, who maintain pretty much the same general birth-rate through the three quinquennial periods.

As the births are not published by the country of birth of the parents to whom each birth is specifically referable, it is not advisable to calculate general birth-rates separately for the population born in the various countries.

Now it must be remembered that the females, as the child-bearing sex, must be considered in every investigation of fecundity as the decisive factor, and adult females especially. The births of the native and foreign born women may then be compared with the adult female population at the three censuses as given in Table IX. The births from native mothers are found by adding to the births purely native those from foreign fathers and native mothers; those from foreign mothers, by adding to the births purely foreign those from native fathers and foreign mothers. The children whose parentage was not stated are distributed between the births of native and foreign parentage in the proportion of the cases known.

TABLE XIX.

SPECIAL BIRTH-RATES OF THE FEMALE ADULT POPULATION.

NATIVITY OF MOTHERS.	Births.			Annual birth-rate.		
	1887-89.	1888-92.	1893-97.	1887-89.	1888-92.	1893-97.
Native . . .	121,968	135,130	146,845	49.19	48.37	48.78
Foreign . . .	126,684	163,443	200,376	96.05	102.62	107.29
State . . .	248,652	298,573	347,221	65.46	68.07	71.18

The difference between the birth-rates, although considerably lowered by the elimination of both the total male sex and the female children, is still very large. The birth-rate of the foreign adult females is twice that of the natives. The birth-rate of the foreign born shows an increase from period to period, while the birth-rate of the natives shows a change in neither direction.

It would throw a clearer light upon the matter if, among the natives as well as the foreign born, the different countries of birth could be distinguished. It is, indeed, possible to make that distinction, at least for a short period, the place of birth of the mothers being known for the three years 1887, 1888, 1889. The figures are given in Table XX., columns 1 to 4. The results of the census of 1885, as given in Table X., column 4, may again be taken as a basis. The annual birth-rate of the natives is found to be 51.8 per thousand, that of the foreign born 109.8. The differences between the birth-rates of the different countries of births are still greater. They vary from 43.6 for the New England states and 51.7 for the natives of Massachusetts to 205.7 for Sweden and 228.9 for Portugal. But it must again be remembered that the population of 1885 does not give a correct basis, the population having changed more or less by 1888.

It may again be assumed that the population of every

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country of birth in 1888 was greater than that of 1885 by three-tenths of the increase of 1885-95. The natives show, then, a birth-rate of 49.2, the foreign born a rate of 98.0. These results agree very well with the rates found for 1883-87 and 1888-92. The other New England states still show the smallest rate; then, ranging upward, the natives of Massachusetts, the natives of the other states of the Union, the Irish, and the English Canadian. The highest figures are shown by Portugal, French Canada, Prince Edward Island, the countries not specified, Sweden, and Germany.

TABLE XX.
SPECIAL BIRTH-RATES BY BIRTHPLACE OF MOTHERS.

COUNTRY OF BIRTH.	Births.*				Birth-rate of female adults, 1887-89.	
	1887.	1888.	1889.	1887-89.	To 1889.	Corrected (1888).
Massachusetts . . .	18,154	18,323	18,661	55,138	51.7	49.2
Other New Engl. st. .	4,449	4,508	4,589	13,546	43.6	42.0
Other states	2,601	2,977	2,835	8,413	76.9	67.8
English Canada . . .	682	1,334	1,418	3,434	143.7	84.3
French Canada . . .	5,221	4,677	5,050	14,948	184.8	152.4
Nova Scotia	2,250	2,339	2,377	6,966	107.4	101.1
Prince Edward Island	531	543	614	1,688	147.8	130.6
New Brunswick . . .	1,059	1,095	1,112	3,266	123.0	115.4
England	2,473	2,688	2,758	7,919	105.4	92.4
Scotland	713	805	850	2,368	108.2	92.9
Ireland	10,475	10,415	11,038	31,928	78.4	76.6
Germany	1,238	1,384	1,305	3,927	139.6	123.5
Sweden	709	817	997	2,523	205.7	125.9
Portugal	543	609	585	1,737	228.9	170.7
Other countries . . .	1,696	2,022	2,498	6,216	198.3	128.0
Unknown	380	357	388	1,125		
Native	25,204	25,808	25,085	77,097	51.8	49.2
Foreign	27,590	28,728	30,602	86,920	109.8	98.0
State	53,174	54,893	57,075	165,142	72.5	67.3

* Cf. *Registration Report*, vol. xli. p. 170f; vol. xlvii. p. 160; vol. xlviii. p. 160. While the totals for the state agree with those given in Table XVII., the totals for the three groups, natives, foreign born, and unknown, do not entirely agree. The reason for this discrepancy may be found in the circum-

The adult females include those who because of their advanced years are not of child-bearing age. There are no statistics for Massachusetts concerning the age of the mothers at the birth of their children. But it may be supposed that as in other countries the physiological capability of the female sex to bear children is exhausted after the fifth decade of life. The women of fifty years and over may then be eliminated, and the births of the native and foreign born women compared with the adult female population under fifty years.*

TABLE XXI.

SPECIAL BIRTH-RATES OF THE ADULT FEMALE POPULATION OF
CHILD-BEARING AGE.

NATIVITY.	1885.†	1890.‡	1895.§
Native, 14-49 years . .	382,717	429,963	468,551
Foreign, 14-49 years . .	203,372	244,575	287,435
State, 14-49 years . .	586,089	674,538	755,986

SPECIAL BIRTH-RATES.

NATIVITY OF MOTHERS.	1883-87.	1888-92.	1893-97.
Native	63.74	62.86	62.68
Foreign	124.58	133.65	139.42
State	84.85	88.53	91.86

The native born show a slight decrease in their birth-rate from period to period. On the other hand, the birth-

stance that among the 1,125 mothers whose country of birth was not known there were 255 whose general nativity (native or foreign born) was stated.

* It is again difficult to understand how Arsène Dumont, in his *Essay* (l. c. p. 338), could state that the censuses do not permit the computation of the proportion of the births to the women of fifteen to forty-nine years. (*Cf.* p. 20.)

† Calculated from *Census of 1885*, vol. i., part 1, p. 443.

‡ Calculated from *Census of 1890*, vol. i. p. 851; vol. ii. p. 44.

§ Calculated from *Census of 1895*, vol. ii. pp. 422 f., 337.

rate of the foreign born, which even in the first period is nearly twice that of the natives, shows a continuous increase. The elimination of the women who have passed the limit of fifty years does not change the birth-rates in favor of the natives. It is not possible to make the same comparison for the different countries of birth.

Now it is clear that the proportion of women living in wedlock exercises the greatest influence upon the birth-rate. As it was stated before, that proportion is considerably higher among the foreign born than among the natives. It will be the scope of the following pages to find how far the difference between the birth-rates of the natives and foreign born is due to that difference in the conjugal condition of the two classes.

It must be taken into consideration that not every birth is in direct relation to a married woman. There are, indeed, children conceived, a part of them also born, out of wedlock. But, as the statistics of Massachusetts do not give at all data regarding the duration of the marriage at the births of the legitimate children, the number of children produced out of wedlock is entirely unknown. On the other hand, in regard to the children born out of wedlock, the record of illegitimacy in Massachusetts must be more or less incomplete, because under existing laws there is no requirement that the certificate shall contain the facts as to legitimacy or illegitimacy.* And, as the notices of late years, especially since 1892, are still more incomplete, it will be preferable to ignore them. This will, in fact, be almost unavoidable, as since 1890 the illegitimate children are not given separately by parentage. The element of error thus introduced will be of but slight importance, as the whole number of illegitimate births recorded constitutes only a small proportion of the total number of births. In the whole period since 1856 it never

* Cf. S. W. Abbott "Vital Statistics of Massachusetts" in *Twenty-eighth Annual Report of the State Board of Health of Massachusetts*, 1896, p. 740.

surpassed 2.2 per cent. The number of illegitimate children, according to the nativity of the mother, is published only up to 1891. The figures for the eight years since 1883 are given in Table XXII.

TABLE XXII*

ILLEGITIMATE CHILDREN BY NATIVITY OF THE MOTHERS, 1883-90.

NATIVITY OF MOTHERS.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
Native	444	445	460	496	524	495	480	519
Foreign	376	370	400	489	532	532	494	597
Not stated	79	79	43	49	102	31	71	90
Totals	899	894	903	1,034	1,158	1,058	1,045	1,206

As the illegitimate birth-rate of the natives and foreign born does not differ conspicuously, the neglect affects about equally the natives and foreign born.

Table XXIII. gives the proportion of the births in the three quinquennial periods to the total married women at the last three censuses. The number of married women is given in Table XIV.

TABLE XXIII.

REFINED BIRTH-RATES OF THE MARRIED WOMEN.

NATIVITY OF MOTHERS.	1883-87.	1888-92.	1893-97.
Native	105.35	106.41	108.39
Foreign	181.51	195.41	199.54
State	134.00	141.75	147.19

The difference becomes a little smaller, indeed, by eliminating the unmarried from the adult women. The natives do not show the oscillation in the different periods which

* *Registration Report*, vol. xlii. p. 236.

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was noticed in the treatment of the whole adult female population. They have a small increase, but the increase of the birth-rate of the foreign born is much more considerable. As the conjugal condition of the women born in different countries is not known, it is not possible to extend that computation to them.*

It remains still to eliminate from the married women those who have passed the fifth decade of life. As the census of 1885 does not give any subdivision of the age group, twenty to seventy-nine years by conjugal condition, and as the subdivision of the census of 1890 does not agree with that of 1895,—the study may be restricted to the figures of 1895.

TABLE XXIV.

REFINED BIRTH-RATE OF THE MARRIED WOMEN IN CHILD-BEARING AGE.

NATIVITY.	Married women 14-49 years of age, 1895.†	Births, 1893-97.	Annual birth- rate.
Native . . .	206,137	146,845	142.47
Foreign . .	159,178	200,376	251.76
State . . .	365,315	347,221	190.09

*The census of 1885, however, shows for some countries of birth the totals of the women who were married or had been married. As among these totals, the women living in wedlock constitute nearly four-fifths (78.9 in the state, 79.4 among the natives, 78.1 among the foreign born), the percentage of women living in wedlock or having been married among the total adult women will furnish a pretty fair indication of the differences which would occur from a comparison of the births with the total adult women and the women capable of bearing a legitimate child. The fact that the not single women constitute only 58.8 per cent. of the total adult women among the natives and 67.7 per cent. among the foreign born (the percentage for the state being 61.9) thus explains the smaller difference of the refined birth-rate of the married native and foreign born women than between the special rates of the total adult women. The percentages of the not single women among the total adult women born in different countries are as follows: Massachusetts, 53.9; other New England states, 74.2; other states, 62.8; English Can-

† Calculated from *Census of 1895*, vol. ii. pp. 216-219.

The discrepancy between the birth-rates of the native and foreign born women living in wedlock becomes still smaller by eliminating the older women; but it is yet very large, the rate for the natives being 14.25 per cent., that for the foreign born 25.18 per cent.*

ada, 59.6; French Canada, 64.1; Ireland, 69.9; Germany, 82.0; all others, 64.5. The small proportion of not single among the adult natives of Massachusetts, which diminishes a little the importance of the small special birth-rate of these natives as well as the large rate of the women born in Germany, seems to be partly due to the small proportion of single women. The extraordinarily small birth-rate of the natives of the other New England states becomes still more striking when viewed in connection with the large proportion of married women.

* It is utterly impossible to get any insight into the fecundity of marriages by comparing the births of a certain period with the marriages at the same time, as does, for instance, Arsène Dumont, in his above-mentioned essay. The births of a certain year, as stated before, are the consequence of the marriages concluded during twenty and more years before, and have but little to do with the marriages of the same year. Abbott, in his *Vital Statistics* (op. cit.), apparently improves that method by comparing the births with the marriages concluded five years before. The result of that method of comparison, as well as that of Dumont, appears in the following table, which contains the birth-rates found above for the two quinquennial periods 1888-92 and 1893-97:—

	Native.		Foreign.		State.	
	1888-92.	1893-97.	1888-92.	1893-97.	1888-92.	1893-97.
Births for every marriage in the same years (Dumont)	2.25	2.35	3.62	3.95	2.84	3.07
Births for every marriage in the preceding five years (Abbott) . . .	2.43	2.48	4.73	4.35	3.31	3.30
General birth-rate of the population	1.71	1.70	4.97	5.22	2.67	2.73
Special birth-rate of the adult females	4.84	4.88	10.26	10.73	6.81	7.12
Special birth-rate of the females of child-bearing age	6.29	6.27	13.37	13.94	8.85	9.19
Refined birth-rate of the married women	10.64	10.84	19.54	19.95	14.18	14.71
Refined birth-rate of the married women of child-bearing age . . .	—	14.25	—	25.18	—	19.01

While all the methods of computing birth-rates for the whole state and for the foreign born lead to a result showing an increase from 1888-92 to 1893-97, a comparison of the births with the marriages of the preceding quinquennial period show a decrease. The mathematical explanation is simply that the marriages of the foreign born and in the whole state have increased more from 1883-87 to 1888-92 than the population and the elements of the population by comparison with which the birth-rates have been computed.

The immense difference found between the general birth-rate of the natives and foreign born is caused partly by the greater number of children among the natives. By eliminating these children the difference decreases much. It decreases still more by eliminating the women who have passed the child-bearing age, and decreases further by eliminating the married women. But the real fecundity of the native women is, nevertheless, much behind that of the foreign born. The high birth-rate of the foreign born is especially due to the large fecundity of the women born in Portugal, French Canada, Prince Edward Island, the countries not specified, and Sweden and Germany; while among the natives the small fecundity of the natives of the other New England states is most striking.

2. *Fecundity of the Mothers.*

In the preceding investigation the births have been taken into consideration. They have been compared with the whole population, with the adult women, with the

If, and only if, the fluctuation in the marriages alone determined the number of married persons in child-bearing age, a comparison of births and marriages could elucidate the problem of the fecundity of marriages. But that, of course, is by no means the case. It is a mere accident that the rates obtained by the comparison of the births of 1893-97 with the marriages in 1888-92, and the birth-rates of the married women of child-bearing age for 1893-97, show about the same differences for the natives and foreign born. It only proves that the difference in the number of marriages among both classes of nativity in 1888-92 and in the women married of child-bearing age was about the same, which need not be the case. The number of married women of child-bearing age in a certain period is partly due to the marriages occurring in the preceding quinquennial period, but only partly. It is affected by the marriages, deaths, divorces, emigrations, and immigrations in the preceding decades, each of which exerts upon it a special modifying influence. Again, with regard to the method applied by Dumont, it must be remembered that this number (of married women) itself affects the marriages and the births in a quite different way. An increasing proportion of persons living in wedlock decreases the marriages, the amount of people in marriageable conjugal condition becoming smaller, and for the same reason increases the births. On the other hand, a decreasing proportion of married women has the tendency to increase the number of marriages and to decrease the births.

adult women of child-bearing age, with the married women, with the married women of child-bearing age. In all these comparisons the starting point was the number of births which occurred during a certain period, the individuality of those who had borne the children being lost. In the following pages the subject will be treated from another point of view; *i.e.*, the mothers will be considered in regard to the number of births each of them had until a certain date. At the census of 1885 each woman who was married at the date of the enumeration or had been married before — *i.e.*, every woman married, widowed, or divorced — was asked how many children she had borne. A later investigation has not been published.

Table XXV. gives separately for the natives and foreign born the total number of women living or having lived in wedlock, and among them those who have not had children.

TABLE XXV.

MARRIED WOMEN WITHOUT CHILDREN, BY NATIVITY.*

NATIVITY.	Total married women.	Married women without children.	Percentage.
Native . . .	291,554	58,850	20.18
Foreign . . .	178,652	23,711	13.27
State . . .	470,206	82,561	17.56

The proportion of women without children among the total number of married women is considerably higher for the natives than for the foreign born, the percentages being 20.2 and 13.3 respectively. The census of 1885 gives separately analogous data for the population born in different countries. The figures as published in the census volume are given in Table XXVI.

In agreement with their small birth-rate, the highest proportions of women without children are found among

* *Census of 1885, vol. i., part 2, pp. 1169, 1173.*

TABLE XXVI.

MARRIED WOMEN WITHOUT CHILDREN BY COUNTRY OF BIRTH.*

COUNTRY OF BIRTH.	Total married women.	Married women without children.	Percentage.
Massachusetts . . .	191,776	37,837	19.73
Other New England states	76,894	16,098	20.94
Other states	22,884	4,915	21.48
Ireland	94,969	10,986	11.67
English Canada . . .	4,750	924	19.45
French Canada . . .	17,276	2,015	11.66
Great Britain	23,295	3,358	14.42
Germany	7,691	858	11.16
British possessions . .	21,206	4,001	18.87
Other countries . . .	9,465	1,569	16.58

the natives and the women born in English Canada; while the women born in French Canada and Germany, who had a very large birth-rate, contain a very small proportion of women without children. The exception made by the women born in Ireland is highly interesting. Ireland with its small birth-rate in 1887-89 had a very small number of married women without children in 1885. This fact speaks in favor of the hypothesis that the married women born in Ireland had a greater fecundity in the preceding decades. It is also interesting that the natives of Massachusetts show a smaller percentage of married women without children than the other natives.

In order to determine the proportion of women who, without regard to their conjugal condition, had not contributed to the propagation of the population, the following comparison will include the single women of marriageable age and give the proportion of women without children among the total adult women, both native and foreign born.

As the proportion of single women among the adult

* Census of 1885, vol. i., part 2, p. 1172, f.

TABLE XXVII.

ADULT WOMEN WITHOUT CHILDREN.*

NATIVITY.	Total adult † women.	Adult women without children.	Percentage.
Native	495,869	263,165	53.07
Foreign	263,792	108,851	41.26
State	759,661	372,016	48.97

native women is much larger than among the foreign born, the difference between the proportion of women without children is further increased by adding for both the natives and foreign born the corresponding numbers of single. The proportion of the adult native women who had not given birth to a child is then 53.1 per cent., while that of the foreign born is but 41.3 per cent. Table XXVIII. gives analogous figures for the women born in different countries. As it was not possible to find the exact number of adult women born in the "British possessions," these women have not been treated separately, but will be found among the women born in other countries.

Massachusetts, with its very small marriage and birth rates, has the largest proportion of adult women without children. Then follow English Canada and the other states, both with a small marriage and birth rate. By far the smallest proportion of women without children is found in the case of Germany. The second place is occupied by Ireland, which, then, in previous decades, seems to have had not only a greater fecundity, but perhaps also a stronger nuptiality. The other New England states, which in 1887-89 had an extraordinarily small marriage-

* Calculated from *Census of 1885*, vol. i., part 1, p. lxiii; part 2, p. 1169.

† The adult women will always include the married native of Massachusetts thirteen years of age.

TABLE XXVIII.

WOMEN WITHOUT CHILDREN BY COUNTRY OF BIRTH.*

COUNTRY OF BIRTH.	Total adult women.	Adult women without children.	Percentage.
Massachusetts . . .	355,755	201,816	56.73
Other New England states	103,670	42,874	41.36
Other states	36,444	18,475	50.69
Ireland	135,796	51,813	38.16
English Canada . .	7,968	4,142	51.98
French Canada . . .	26,968	11,707	43.41
Great Britain . . .	32,787	12,850	39.19
Germany	9,379	2,546	27.15
Other countries . .	50,894	25,793	50.68

rate and the smallest birth-rate, have, nevertheless, a percentage of adult women without children much below the average of the state, and equal to the average of the foreign born, and a smaller percentage than the French Canadians with their much higher marriage-rate and their excessively high birth-rate. The explanation of this is that the women born in the other New England states for one reason or another, perhaps as the consequence of a formerly strong nuptiality, had a very small proportion of single women.

In order to prove to a more satisfactory degree the accuracy of the results stated above, it would be useful to take into consideration the time which the married women have lived in wedlock. It is evident that a large proportion of women married only six months or less will have the effect of increasing the proportion of married women without children, although that increase would not mean anything as regards the fecundity of the married women. In a general way the proportion of the married women without children will largely depend upon the total number

* Calculated from *Census of 1885*, vol. i., part 1, pp. 572, 574; part 2, p. 1172.

of years the married women have lived in wedlock. But the census does not give the duration of the marriage. This want can, to a certain degree, be supplied by treating separately the various age groups, as it can be safely supposed that the number of newly married women will be comparatively high in the youngest age groups, and that generally the proportion of married women who, because of the recency of their marriage had not yet borne a child at the time of the census, will not differ much from the women born in different countries.

Table XXIX. gives, by age groups, the total number of married women, those without children, and the proportion of the latter for the native and foreign born population.

It may be remembered that among the total number of married women the natives had a proportion of 20.2 per cent. without children, while the percentage for the foreign born was but 13.3. In the youngest age group,—i.e., among the married women from fourteen to nineteen years,—the proportion of women without children is pretty much the same for the natives as for the foreign born. The reason may be found in the above-indicated circumstance that among the married women of this age group the newly married are so numerous that no influence of the different fecundity of the two groups can be expected to appear in the respective figures. The next group shows a much higher proportion of married women without children among the natives than among the foreign born. Here the main reason will be a proportion of more or less permanently barren women among the natives. In the next age group the difference is still larger, and the proportion of the women without children remains smaller in every age group among the foreign born. The women of fifty to fifty-nine years may perhaps be considered as forming the most normal age group, their fecundity being exhausted and their number being not so much deci-

TABLE XXIX.

MARRIED WOMEN WITHOUT CHILDREN BY NATIVITY AND AGE GROUPS.

MARRIED WOMEN BY AGE GROUPS.*

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.	Age unknown.
Native	3,207	59,902	70,917	56,567	43,028	51,033	6,879	21
Foreign	1,175	30,818	45,821	44,472	31,507	23,040	1,808	11
State	4,382	90,720	116,738	101,039	74,535	74,073	8,687	32

MARRIED WOMEN WITHOUT CHILDREN BY AGE GROUPS.†

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.	Age unknown.
Native	1,888	19,091	14,354	9,845	6,348	6,498	817	9
Foreign	712	7,747	5,626	4,564	2,928	2,000	132	2
State	2,600	26,838	19,980	14,409	9,276	8,498	949	11

PERCENTAGE OF MARRIED WOMEN WITHOUT CHILDREN BY AGE GROUPS.

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.
Native	58.87	31.87	20.24	17.40	14.75	12.73	11.88
Foreign	60.60	25.14	12.98	10.26	9.29	8.68	7.30
State	59.33	29.58	17.12	14.26	12.45	11.47	10.92

* Census of 1885, vol. I, part 2, p. 1173.

† *Ibid.*, p. 1172.

mated by mortality as to give too small figures for a fair comparison. Among the native married women of fifty to fifty-nine years there are 14.8 per cent. without children, while only 9.3 of the foreign born had not given birth to a child. That seems to prove, beyond doubt, a larger proportion of permanently barren women among the natives than among the foreign born. But it is not impossible that mortality affects in a different way the barren natives and the foreign born. If the excess of women without children among the natives is caused by a voluntary barrenness, while the barrenness of the foreign born is generally the result of a physical defect, it would be possible that the mortality of the barren foreign born women would be relatively higher than that of the natives, so that the proportion of the barren women living at the sixth decade would be smaller for the foreign born than for the natives. But it is not probable that the above-stated difference could be accounted for to any large degree by this contingency.

Table XXX. gives the total number of married women by age groups, those without children, and a comparison of both for population born in the different countries.

Among the total married women the smallest proportions of women without children were found for Germany, Ireland, and French Canada, while the three groups of natives and English Canada had the largest proportions. The discrepancies in the above table in the youngest age group may be again explained by the decisive influence of the newly married. If the French Canadians occupy in this group the first rank, it may be partly the consequence of their higher fecundity; but it will be at least partly because they marry younger. It is possible, although not probable, that this is also the reason why the women of Massachusetts, who generally are so barren, follow immediately the women born in French Canada. An astounding regularity gives to the different countries for

the next four age groups the same rank they occupied in the list of the total married women. Only the following exceptions can be noted. In the group twenty to twenty-nine Great Britain ranges before Ireland; in the group thirty to thirty-nine Great Britain and the British possessions have a higher percentage of women without children than the three groups of natives. The figures for the group over sixty years are so small that the results are not well defined, although the superiority of Germany, Ireland, and French Canada over the English Canadians and the natives appear still in these groups. The Germans and French Canadians have, in every group after the third decade of life, less than 10 per cent. of married women without children, the minima being 2.9 per cent. for the French Canadians in the group sixty to seventy-nine years, for the German 2.2 per cent. in the group eighty years and over, and 6.9 per cent. in the group fifty to fifty-nine years. If the insignificant exception which the women born in the other New England states constitute for the oldest group is ignored, the three groups of natives never attain so low a percentage as 10. The married women of Massachusetts show in every group under fifty years a smaller percentage than the other natives.

It may now seem useful to extend the same comparison to the total adult women, neglecting their conjugal condition. Table XXXI. gives by age groups the total number of adult women, those without children, and the proportion of the latter for the native and foreign born population.

As for the entire population, in every group the proportion of the women without children among the total adult women is more or less higher for the natives than for the foreign born. The differences are most conspicuous in the groups between thirty and sixty years. The difference is very small for the group twenty to twenty-nine years.

TABLE XXX.

MARRIED WOMEN WITHOUT CHILDREN BY COUNTRY OF BIRTH AND AGE GROUP.

MARRIED WOMEN.*

COUNTRY OF BIRTH.	14-19.†	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.	Age unknown.
Massachusetts	2,299	41,399	46,380	35,225	26,961	34,441	5,163	8
Other New England states	635	12,596	17,736	16,569	13,379	14,487	1,500	2
Other states	283	6,007	6,801	4,773	2,688	2,105	216	11
Ireland	138	9,625	21,656	26,216	20,243	15,756	1,323	7
English Canada	58	1,420	1,531	1,003	476	932	9	1
French Canada	430	5,900	4,582	3,778	2,128	1,095	83	1
Great Britain	153	4,543	6,398	5,347	3,781	2,883	190	1
Germany	41	1,408	2,024	1,316	1,304	952	45	1
British possessions	191	5,929	6,656	4,463	2,519	1,349	99	2
Other countries	164	2,693	2,974	1,749	1,051	773	59	2

MARRIED WOMEN WITHOUT CHILDREN.‡

COUNTRY OF BIRTH.	14-19.†	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.	Age unknown.
Massachusetts	1,318	12,610	8,800	5,957	4,031	4,471	645	5
Other New England states	390	4,620	4,195	3,064	1,928	1,753	148	4
Other states	180	1,861	1,359	824	389	274	24	4
Ireland	94	2,397	2,424	2,642	1,889	1,444	94	2
English Canada	42	458	263	115	40	24	2	2
French Canada	238	1,081	362	201	96	32	5	5
Great Britain	97	1,084	878	626	408	249	16	16
Germany	29	301	191	155	30	80	1	1
British possessions	118	1,788	1,130	559	285	101	10	10
Other countries	94	638	378	245	130	70	4	4

PERCENTAGE OF MARRIED WOMEN WITHOUT CHILDREN.

COUNTRY OF BIRTH.	14-19.†	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.
Massachusetts	57.3	30.5	19.0	16.9	15.0	13.0	12.5
Other New England states	69.4	36.7	23.7	18.5	14.4	12.1	9.9
Other states	63.6	31.0	20.0	17.3	14.5	13.0	11.1
Ireland	68.1	24.9	11.2	10.1	9.3	9.2	7.1
English Canada	72.4	30.8	17.0	11.5	8.4	10.3	22.2
French Canada	53.3	20.8	7.9	5.3	4.5	3.9	6.0
Great Britain	63.4	23.9	13.7	11.7	10.8	8.6	8.4
Germany	70.7	21.4	9.4	8.7	6.9	8.4	9.2
British possessions	61.8	30.2	17.0	12.7	11.3	7.5	10.1
Other countries	57.3	24.4	13.7	14.0	11.4	9.1	6.8

* Census of 1885, vol. i., part 2, p. 1173.

† The age group fourteen to nineteen will always include the married native of Massachusetts thirteen years of age.

‡ Census of 1885, vol. i., part 2, p. 1172.

TABLE XXXI.
ADULT WOMEN WITHOUT CHILDREN BY NATIVITY AND AGE GROUPS.
ADULT WOMEN BY AGE GROUPS.*

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-69.	70 and over.	Age unknown.
Native	89,233	134,355	92,379	66,751	49,051	56,341	7,721	38
Foreign	24,991	72,522	56,415	49,444	33,917	24,578	1,903	22
State	114,224	206,877	148,794	116,195	82,968	80,919	9,624	60

ADULT WOMEN WITHOUT CHILDREN BY AGE GROUPS.†

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-69.	70 and over.	Age unknown.
Native	87,914	93,544	35,816	20,029	12,371	11,806	1,659	26
Foreign	24,528	49,451	16,220	9,536	5,338	3,438	227	13
State	112,442	142,995	52,036	29,565	17,709	15,244	1,886	39

PERCENTAGE OF WOMEN WITHOUT CHILDREN BY AGE GROUPS.

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-69.	70 and over.
Native	98.52	69.62	38.77	30.01	25.22	20.95	21.49
Foreign	98.15	68.19	28.75	19.28	15.74	14.39	11.93
State	98.44	69.12	34.97	25.44	21.34	18.96	19.60

* Census of 1885, vol. i., part 1, p. lxiii.

† Calculated from Census of 1885, vol. i., part 1, p. lxiii; part 2, p. 1172.

The reason is to be found in the surprising circumstance that the percentage of single women in this age group is smaller for the natives than for the foreign born.*

Table XXXII. gives, in the same way, by age groups the total number of adult women, those without children, and a comparison of both for the population born in the different countries.

It may be remembered that Germany had by far the smallest proportion of women without children among the total adult women, and that it was followed by Ireland and Great Britain; while Massachusetts, English Canada, and the other states had the largest proportions. This order does not appear in the first age group for the reason stated above, neither does it appear regularly in the following age groups. Germany, it is true, occupies the first rank in the groups between twenty and fifty years and in the oldest group, and has the second place in the groups between fifty and eighty. Great Britain occupies the third place in every group over twenty years. Massachusetts has the highest proportion of women without children in every group over thirty years, and the second place in the other groups. Also the other states and English Canada have, in every age group, a rather high proportion of women without children. But the exceptions are not less numerous. The women born in French Canada have the smallest proportion of women without children in the age groups fourteen to nineteen and forty to seventy-nine years, and occupy the second place in the other groups; while in the average they have a proportion of women without children which is not very low. The reason must be sought in the excessive proportion which the women between fourteen and twenty years make of

* The percentage of single women among the total adult women of 20-29 years was, in 1885, 55.4 for the natives and 57.5 for the foreign born. (*Cf.* p. 33.) This proportion is very different from the corresponding figures for 1895, which, being 59.5 and 51.9, show a high excess of single among the natives.

TABLE XXXII.
ADULT WOMEN WITHOUT CHILDREN BY COUNTRY OF BIRTH AND AGE GROUPS.

ADULT WOMEN.^a

COUNTRY OF BIRTH.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.	Age un- known.
Massachusetts	74,446	100,156	62,481	42,789	31,867	38,658	5,846	12
Other New England states	8,969	22,662	21,620	15,569	14,787	13,429	1,628	6
Other states	5,818	11,537	8,378	5,993	2,897	2,254	247	20
Ireland	7,663	30,644	27,722	29,546	21,910	16,928	1,370	13
English Canada	1,003	3,070	1,966	1,120	542	254	12	1
French Canada	5,792	8,695	5,193	3,913	2,170	1,118	87	1
Great Britain	3,983	8,506	7,371	5,726	3,995	3,010	195	1
Germany	873	2,042	2,096	2,007	1,335	979	46	1
Other countries	5,677	19,565	12,067	7,132	3,965	2,289	193	6

ADULT WOMEN WITHOUT CHILDREN.^b

COUNTRY OF BIRTH.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.	Age un- known.
Massachusetts	73,465	71,467	24,901	13,521	8,437	8,688	1,328	9
Other New England states	8,734	14,686	8,079	5,064	3,386	2,695	276	4
Other states	5,715	7,391	2,836	1,444	598	423	55	13
Ireland	7,619	23,416	8,490	5,972	3,551	2,616	141	8
English Canada	987	2,088	678	332	106	46	5	5
French Canada	5,600	4,576	393	336	188	55	9	1
Great Britain	3,927	5,047	1,851	1,005	622	376	21	1
Germany	861	935	263	257	131	107	2	2
Other countries	5,534	13,389	3,945	1,734	800	338	49	4

PERCENTAGE OF ADULT WOMEN WITHOUT CHILDREN.

COUNTRY OF BIRTH.	14-19.	20-29.	30-39.	40-49.	50-59.	60-69.	80 and over.
Massachusetts	98.7	71.4	39.9	31.6	26.9	22.5	22.7
Other New England states	97.4	64.8	37.4	27.3	22.6	17.5	17.0
Other states	98.2	64.1	34.3	26.8	20.6	18.8	22.3
Ireland	99.4	76.4	30.6	20.2	16.2	15.5	10.3
English Canada	98.4	68.0	34.5	20.7	19.6	18.1	41.7
French Canada	96.7	52.6	19.1	8.6	6.4	4.9	10.3
Great Britain	98.6	59.3	25.1	17.6	15.6	12.5	10.8
Germany	98.6	48.8	12.5	14.8	9.1	10.9	4.3
Other countries	97.5	68.4	32.7	24.3	20.2	14.8	25.4

* Calculated from *Census of 1886*, vol. i., part 1, pp. 372-374.

† Calculated from *Census of 1886*, vol. i., part 2, p. 1172.

the entire adult female population born in French Canada, which, although containing a relatively large number of women with children, have a tendency to decrease the average for the whole. The women born in Ireland, who in the average have a very small proportion of adult women without children, have the highest proportion among the women under thirty years, and in every group between thirty and eighty years, a higher proportion than the average of the foreign born. The women born in the other New England states, who exhibited a surprisingly small proportion of women without children in the average, range in the three groups between thirty and sixty years immediately before Massachusetts, and have in no group an excessively small proportion of women without children. The reason is to be found in the circumstance that the adult women born in Ireland and the other New England states are comparatively old, and hence are less numerous in the age groups which generally show more women without children. (*Cf.* p. 32, note *.) It can then easily be seen that a study of the average number of childless women without respect to the different age groups does not afford a satisfactory result.

In the preceding pages the proportion of the women without children has been treated. The complement of their proportions are the relative percentages of women with children. The subject of the following pages will be the average number of children born to every woman.*

Table XXXIII. gives for the natives and foreign born the average number of children born to each married woman.

The average number of children born to each native

* This question has been treated in the analysis of the census of Massachusetts in 1885, in a way deserving very little credit. Instead of affording the average number of children born to every married woman, the official analysis gives the average number born to every married woman who had children, furnishing thus an enormous number of averages which are practically useless.

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TABLE XXXIII.

NUMBER OF CHILDREN BY NATIVITY OF MOTHERS. AVERAGES.

NATIVITY.	Number of children.*	Average number of children born to each married woman.	Average number of children born to each adult woman.
Native . . .	784,499	2.69	1.58
Foreign . . .	809,548	4.53	3.07
State	1,594,047	3.39	2.10

married woman is 2.7, that for the foreign born 4.5, while that for the state is 3.4.

Table XXXIV. gives the same data for the different countries of birth.

TABLE XXXIV.

NUMBER OF CHILDREN BY COUNTRY OF BIRTH OF THE MOTHERS. AVERAGES.

COUNTRY OF BIRTH.	Number of children.†	Average number of children born to each married woman.	Average number of children born to each adult woman.
Massachusetts	518,614	2.70	1.46
Other New England states,	202,673	2.64	1.96
Other states	63,212	2.76	1.73
Ireland	472,467	4.97	3.48
English Canada	15,228	3.21	1.91
French Canada	94,476	5.47	3.50
Great Britain	94,030	4.04	2.87
Germany	32,415	4.31	3.46
British possessions	69,598	3.28	} 1.98
Other countries	31,334	3.31	

In general, those countries of birth which had a small proportion of married women without children have a high average of children for each married woman, and *vice versa*. French Canada and Ireland, which had very small proportions of married women without children, have

* Census of 1885, vol. i., part 2, p. 1169.

† Census of 1885, vol. i., part 2, p. 1199.

a high average of children for each married woman; while the three groups of natives and English Canada, with their very large proportion of married women without children, have a small average of children. But the married women born in Germany, who had the smallest proportion of women without children, have a smaller number of children than the average of the foreign born; while the women born in the other states had the highest proportion of women without children, and have a larger number of children than the natives of New England. The high birth-rate of the women born in French Canada, which was found for 1887-89, agrees with the high average number of children for each married woman born in these countries; while the contrary can be said about the three groups of natives and the English Canadians. The small birth-rate of Ireland, as was seen, did not coincide with a high proportion of women without children; nor does it manifest itself in the average of children for each married woman,—a new indication that the low fecundity of the Irish may be of recent date.

These results will appear more clearly by including the total adult women. As the proportion of the single is considerably higher among the natives than among the foreign born, the differences between the two groups will be found still larger. The average number of children for each adult native woman is 1.6; that of the foreign born is 3.1, or nearly double; while that for the state is 2.1 (*v.* Table XXXIII., column 3).

Among the women born in the different countries the highest average of children is for French Canada, Ireland, and Germany, the proportion being in the three cases 3.5. If, on the one hand, this result agrees with the fact that these countries show also the highest average of children for each married woman, the fact must not be lost sight of that these averages differ widely. The married women born in French Canada have an average

of 5.5 children, those born in Ireland 5.0, those born in Germany but 4.2. The reason for this discrepancy is to be found in the different conjugal condition of the population born in these countries. It is not astonishing that Germany, with its high proportion of women living in wedlock, shows such a slight difference between the average of children for each adult woman and for each married woman. It is likewise not surprising that Ireland with its smaller, and French Canada with its still smaller proportion, of married women, show such considerable differences. By far the lowest in the list are the natives of Massachusetts, with their high proportion of single women. They have an average of less than 1.5 children for each adult woman; while the natives born in the other New England states, with their smaller average of children for each married woman, have an average of nearly 2.0 children for each adult woman (*v.* Table XXXIV.).

It will be of interest to see if the average number of children for each married native woman is equally smaller in every age group than that of the foreign born.

Table XXXV. gives, by age groups, the number of children and the averages for both married and adult, for the natives and foreign born.

If, for the reason already given, no attention is paid to the youngest age group, the proportion of women without children among the native women is higher in every age group than among the foreign born, and the average number of children for each married woman is smaller in every age group of the married women. And in the same way it may be stated that, as in every age group the proportion of women without children among the total adult native women is higher than among the foreign born, so the average number of children for each adult woman is smaller in every age group of the adult women. But it must be noted that in both comparisons the differences between the average number of children are the greatest in the groups of child-bearing age.

TABLE XXXV.
NUMBER OF CHILDREN BY NATIVITY AND AGE GROUPS OF MOTHERS. AVERAGES.
TOTAL NUMBER OF CHILDREN BY AGE GROUPS OF MOTHERS*

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.	Age unknown.
Native.	1,529	80,216	169,798	161,379	140,669	198,887	32,071	50
Foreign	545	53,065	185,207	244,378	180,840	134,036	11,439	47
State	2,075	133,281	355,005	405,657	321,509	332,923	43,500	97

NUMBER OF CHILDREN FOR EVERY MARRIED WOMAN BY AGE GROUPS.

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.
Native.	0.48	1.34	2.39	2.85	3.27	3.90	4.66
Foreign	0.46	1.72	4.04	5.50	5.74	5.82	6.32
State	0.47	1.47	3.04	4.01	4.31	4.49	5.01

NUMBER OF CHILDREN FOR EVERY WOMAN BY AGE GROUPS.

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.
Native.	0.02	0.60	1.84	2.42	2.87	3.53	4.15
Foreign	0.02	0.73	3.28	4.94	5.33	5.45	6.01
State	0.02	0.64	2.39	3.49	3.88	4.11	4.52

* Calculated from Census of 1885, vol. i., part 2, pp. 1174-1181.

The census does not give analogous figures for women born in the different countries.

3. *Summary on Fecundity.*

The main conclusions which may be drawn from the preceding consideration of fecundity are the following:—

I. In the quinquennial period from 1883 to 1897 the general birth-rate of the foreign born is three times that of the natives. This difference is partly due to the larger proportion of children and adult women living out of wedlock among the natives. The special birth-rate of the foreign born adult women is still twice that of the natives, while the refined birth-rate of the foreign born married women is four-fifths higher than that of the natives. The age constitution of the total adult or the married women does not materially influence these differences. A restriction of the comparison to the women of child-bearing age alters the differences only a trifle. The refined birth-rate of the married women of child-bearing age was seventenths higher for the foreign born than for the natives. A subdivision of the fifteen years into three quinquennial periods shows the birth-rates of the natives to be rather steady, while for all the different birth-rates of the foreign born it shows a decided increase from period to period.

II. In the triennial period from 1887 to 1889 the special birth-rate of the adult women born in Massachusetts was that of the average of the natives; while that of the women born in the other New England states was less, and that of the women born in the other states was considerably higher, the latter still being smaller than that of any foreign country. Among the different countries of birth, Ireland, with a rate more than a half higher than Massachusetts, had the smallest one. English Canada, England, and Scotland were the only groups which also had a rate less than twice as high as Massachusetts.

The French Canadians and the women born in Portugal seem to have a birth-rate more than three times as high as the natives of Massachusetts. But the statistics of birth of the mothers born in the different countries need many improvements before warranting final conclusions.

III. At the census of 1885 the number of women who were married or had been married without having ever borne a child was one-fifth among the natives, while it was but two-fifteenths for the foreign born. The differences are even greater in a comparison of the total adult women. They appear also in every single age group of the married women, while among the total adult women under thirty years of age the natives showed a trifle smaller proportion of childless women than the foreign born. The average number of children borne by every married woman was two-thirds higher for the foreign born than for the natives; while among the total adult women the foreign born had, on the average, twice the number of children of the natives. These differences are especially high for the age groups between thirty and sixty.

IV. The percentage of childless married women born in the United States and English Canada was one-fifth; while that of the women born in Germany, French Canada, and Ireland was but one-ninth. Although these differences are not so great in each age group, they still appear in every one. The average number of children born to each mother was the smallest for the natives: it was four-sevenths higher among the German women, six-sevenths higher among the Irish women, and twice as high among the French Canadians. In general, the proportion of childless married women agrees with the average number of children for each married woman. But that is not always the case.

IV. MORTALITY.

1. Deaths.

The data of deaths published separately for the natives and foreign born in Massachusetts are extremely meagre. No figures were given at all up to 1888, and since 1888 only the total number of deaths of native and foreign born persons can be found, no distinction being made for sex, age, etc. The figures as published in the *Registration Reports* are as follows:—

TABLE XXXVI.
DEATHS BY NATIVITY, 1888-97.*

YEAR.	Total.	Nativity.		
		Native.	Foreign.	Unknown.
1888	42,097	31,124	10,574	399
1889	41,777	30,650	10,687	440
1890	43,528	31,605	11,508	415
1891	45,185	32,733	11,907	545
1892	48,762	35,097	13,044	621
1893	49,084	35,285	13,136	663
1894	46,791	34,301	11,895	595
1895	47,540	34,472	12,515	553
1896	49,381	35,885	12,984	512
1897	47,419	34,046	12,926	447
1888-92	221,349	161,209	57,720	2,420
1893-97	240,215	173,989	63,456	2,770

In Table XXXVII. the native and foreign born decedents in the annual average of the two quinquennial periods are compared with the population found at the censuses of 1890 and 1895. The deaths of persons whose nativity was unknown are divided between the natives and foreign born in the proportion of the cases known.

The rate for the foreign born being already smaller in the first period decreases still more than that of the natives in the following period.

* *Registration Report*, vols. xlvii.-lvi., Table 1.

TABLE XXXVII.

GENERAL DEATH-RATES OF THE NATIVES AND FOREIGN BORN.

DEATHS.

NATIVITY.	1888-92.	1893-97.
Native	162,991	176,019
Foreign	58,358	64,196
State	221,349	240,215

ANNUAL DEATH-RATES.

NATIVITY.	1888-92.	1893-97.
Native	20.61	20.29
Foreign	17.76	16.78
State	19.77	19.22

It would throw a clearer light upon the subject if, among the natives as well as among the foreign born, it was possible to distinguish the different countries of birth. It is only possible to make that distinction for the two years 1888 and 1889, for which the countries of birth of the decedents are published. The figures are given in Table XXXVIII., columns 1 and 2. There arises the difficulty of finding the state of population at a date appropriate for comparison with these deaths. The correct basis would be the population at the end of 1888. That, however, is unknown. As for the above-mentioned reasons the census next to this date — *i.e.*, that of 1890 — is not applicable, it will be necessary to recur to the enumeration of 1885 (*v.* Table IV.). The 839 persons deceased whose nationality was unknown — they constitute but 1 per cent. of the total — have been ignored.

The death-rate of the natives is found to be 21.8 per mille, that of the foreign born 20.2, and that for the state 21.6. The differences between the death-rates of

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TABLE XXXVIII.

GENERAL DEATH-RATES BY COUNTRY OF BIRTH. 1888-89.

COUNTRY OF BIRTH.	Deaths.		Annual general death-rate 1888-89.	
	1888.*	1889.†	To 1885.	Corrected (1888).
Massachusetts	26,015	25,824	23.2	21.3
Other New England states . .	4,173	3,990	18.8	18.3
Other states	936	836	10.9	9.4
English Canada	84	133	6.8	3.6
French Canada	1,064	1,035	16.3	13.1
Nova Scotia	612	611	15.0	14.0
Prince Edward Island	95	133	16.7	14.8
New Brunswick	296	316	18.6	17.1
England	972	1,025	17.5	14.2
Scotland	272	298	17.8	14.2
Ireland	5,996	6,056	24.6	23.6
Germany	404	371	16.8	14.6
Sweden	161	169	17.5	10.4
Portugal	100	82	14.9	12.2
Other countries	518	458	18.6	10.6
Unknown	399	440		
Native	31,124	30,650	21.8	20.2
Foreign	10,574	10,687	20.2	17.2
State	42,097	41,777	21.6	19.5

the population born in the various countries are very wide. They vary from 6.8 per mille for English Canada to 24.6 for Ireland. It will then be seen that the death-rate for Ireland is even higher than that of the natives of Massachusetts, who occupy the second rank. But it can easily be seen that the small difference between the death-rate of the natives and foreign born does not agree with the results above stated. The reason is that the population of 1885 is not a fair basis of comparison, the population for the different countries of birth having increased up to the end of 1888 in quite different degrees. It may be assumed that the increase from 1885 to the end of 1888 was for each country seven-tenths of the increase of

* *Registration Report*, vol. xlvii. p. 164.

† *Ibid.*, vol. xlviii. p. 164.

the period 1885 to 1890; and, for the cases where the population of 1890 is not known, seven-twentieths of the increase between 1885 and 1895. The death-rates so corrected are given in Table XXXVIII., column 4. The rates for the natives and the foreign born are now 20.2 and 18.2 respectively, and for the state 19.5,—a result agreeing fairly well with the rate found above for the quinquennial period 1888-92. The excessively small rate of English Canada has become still less, so that it reaches only 3.6. The rates for the other states, Sweden, Portugal, and the countries not specified, are also very small. But the absolute number of deaths considered for most of the countries is too small to permit final conclusions. One fact, however, should be noted; namely, the high death-rate of the people born in Ireland, which is higher even than that of the people born in Massachusetts. If all the countries are combined in four great groups, consisting of the population born in Massachusetts, the other natives, the Irish, and all the other foreign born, the following rates are found: 21.4, 15.7, 23.6, and 12.7.

Now it must be remembered that among the natives not born in Massachusetts and among the foreign born, both of whom are immigrants, the number of children who have a specially high mortality is but small. Other things equal, those born outside of Massachusetts would show a lower death-rate than the natives of the state. But, as the age of the decedents is not given separately for the natives and foreign born, it is not possible to determine accurately the influence of the different age constitutions. But it seems that the real mortality of the natives is smaller than that of the foreign born.* This would

* In his treatise *The Vital Statistics of Massachusetts* (op. cit. p. 747), Dr. Samuel W. Abbott states that in the average of the eight years, 1888 to 1895, the general death-rate of the natives was 20.4 per mille, while that of the foreign born was but 17.4. He adds, "The difference may be partly accounted for by the difference in the age constitution of these two groups of the population, as was stated under the section relating to marriage." In order to determine if that statement is true for the death-rate, the following table will show what

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diminish the importance, then, of the smaller fecundity of the native women. That question, however, will be treated in the following paragraphs.

the number of deaths in the period 1893-97 would be among the natives and foreign born if their death-rate was at every age period the same; i.e., that of the total population. Column 3 gives the death-rate of the total population for every quinquennial group up to the age of twenty-five years, and of every decennial age group for the older population. Columns 6 and 7 give the number of deaths which would have occurred among the natives and foreign born, assuming their mortality to be that of the total population.

Age groups.	Population 1895.	Deaths 1893-97.	Quinquennial death-rate 1893-97.	Native population 1895.	Foreign born population 1895.	Deaths 1893-97.	
						Native population.	Foreign born population.
0-5	235,647	78,779	33.43	229,694	5,953	76,789	1,990
5-10	224,119	6,730	3.00	203,411	20,708	6,108	622
10-15	302,900	3,460	1.11	172,746	30,154	2,946	514
15-20	235,881	6,305	2.79	168,745	67,136	4,710	1,595
20-25	265,983	9,982	3.75	170,488	95,515	6,398	3,584
25-35	465,943	20,148	4.32	264,468	201,455	11,437	8,711
35-45	341,535	18,832	5.51	205,422	136,113	11,327	7,508
45-55	245,586	19,377	7.89	135,645	109,941	10,781	8,596
55-65	157,651	22,334	14.17	91,680	65,971	12,968	9,366
65-75	90,088	25,561	28.37	58,490	31,598	16,596	8,965
75-85	35,405	20,547	58.03	26,503	8,902	15,381	5,166
85-95	6,123	7,105	116.04	4,828	1,295	5,602	1,503
Over 95.	308	659	181.49	198	110	359	200
Unknown	3,014	496	16.46	1,935	1,079	318	178
Total . .	2,500,183	240,215	9.608	1,735,253	764,930	181,740	58,475

The total number of deaths would then be 181,739 for the natives and 58,476 for the foreign born, the annual death-rate of the native being 20.95, that of the foreign born 15.29. Now the actual number of deaths among the natives was 176,019, or 20.29 per mille, that of the foreign born 64,196, or 16.78. As a death-rate of the natives of 20.95 corresponds to a death-rate of the foreign born of 15.29, the mortality is in favor of the natives. It is still more favorable for the period 1888-95, the rates stated by Mr. Abbott being 20.4 and 17.4. It may be objected that this method of estimating the normal death-rate of the natives and foreign born does not give accurate results, as no attention is paid to the proportion of sexes either among the population or among the deceased, and especially as the age groups chosen are not and cannot be small enough. But the difference caused by that imperfection in the method will be but slight. It also has probably only the effect of representing the mortality of the foreign born, especially in the youngest group, as too high, as their number in the first year of age, with its high mortality, is very small. The difference of the normal death-rates of the natives and foreign born would then be still higher. At all events, Mr. Abbott is not right in saying that the excess of the general death-rate of the natives over that of the

2. *The Survivors.*

In the last part of the chapter on fecundity the average number of children borne by each woman was investigated. In the preceding pages the mortality has been treated. It will now be useful to study the conditions resulting from both, and consider the number of living children for every woman.

Table XXXIX. gives the number of children living for each mother and for each adult woman at the census of 1885.

TABLE XXXIX.

NUMBER OF CHILDREN LIVING BY NATIVITY OF MOTHERS. AVERAGES.

NATIVITY.	Number of children living.*	Average number of children living for each married woman.	Average number of children living for each adult woman.
Native	560,890	1.92	1.13
Foreign	537,030	3.01	2.04
State	1,097,920	2.33	1.45

It may be remembered that the average number of children born to native married women was 2.7, to foreign born 4.5. The average number of children living for each native married woman was 1.9, for each foreign born 3.0. The percentage of surviving children then was 71.4 for the natives and 66.2 for the foreign born. The difference between the living children for the natives and the foreign born is then not only absolutely, but also relatively smaller. This, however, does not necessarily prove a smaller mortality among the natives. For instance, even if other factors be ignored, nothing is known about the age of the children surviving.

foreign born may be partly accounted for by the difference in the age constitution of these two classes. The entire excess and more is accounted for by that difference. The mortality of the natives is less than that of the foreign born.

* Census of 1885, vol. I., part 2, p. 1169.

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The same investigation may be extended to the women born in the different countries. Table XL. gives the number of children living for each mother and for each adult woman.

TABLE XL.

NUMBER OF CHILDREN LIVING BY COUNTRY OF BIRTH OF MOTHERS.

AVERAGES.

COUNTRY OF BIRTH.	Number of children living.	Average number of children living for each married woman.	Average number of children living for each adult woman.
Massachusetts	373,007	1.95	1.05
Other New England states,	143,147	1.86	1.38
Other states	44,736	1.95	1.23
Ireland	304,048	3.20	2.24
English Canada	11,106	2.34	1.39
French Canada	65,223	3.78	2.42
Great Britain	61,765	2.65	1.88
Germany	23,815	2.97	2.43
British possessions	49,742	2.35	} 1.42
Other countries	22,331	2.36	

The percentage of surviving children was for most countries between 70 and 72 per cent. (Massachusetts 71.9, British possessions 71.5, other countries 71.3, other states 70.8, other New England states 70.6, Germany 70.4). For the English Canadians it was 72.9, while for the French Canadians it was but 69.0, and reached for the women born in Great Britain and Ireland percentages so small as 65.7 and 64.4. But it must again be remembered that the age of the children, which is strongly influenced by the age constitution of the married women, is here of great importance. The average number of children living is the smallest for the natives of the other New England states, then follow the two other groups of natives. The number is the highest for the French Canadians, Irish, and Germans. It is highly interesting to see that the rank the different countries of birth occupy in the table is

exactly the same as in the table which showed the average number of children born to every married woman, while the same cannot be stated of the table of the childless women. The married women born in New England have, on the whole, less childless women than the women born in the other states, while they have not more children living. The French Canadian women have a few more childless women than the Irish, and both have more childless women than the Germans. At the same time the French Canadian women have a higher average of living children than the Irish, and both have more than the German women. The computation of the living children for each adult woman offers again slightly different results, due to the small number of married women among the adult natives of Massachusetts and the high proportion among the natives of the other New England states and Germany.

In order to eliminate the differences due to the different age constitution among the native and foreign born women, Table XLI. gives by age groups the average number of children living for each native and foreign born married woman and adult woman. In every age group the number is higher among the married foreign born. The differences are especially large for the age groups from 30 to 60. Among the adult women the average number of children living is higher for the natives only in the youngest, and therefore very insignificant, age group. The same comparison cannot be made for the women born in the different countries.

3. *Summary on Mortality.*

The main conclusions which may be drawn from the preceding study of mortality are the following:—

I. In the decennial period from 1888 to 1897 the general death-rate of the natives is nearly one-fifth higher than that of the foreign born. That difference is due to

TABLE XL.

NUMBER OF CHILDREN LIVING BY NATIVITY AND AGE GROUPS OF MOTHERS. AVERAGES.

1. TOTAL NUMBER OF CHILDREN LIVING BY AGE GROUPS OF MOTHERS.*

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.	Age unknown.
Native	1,333	66,741	133,149	120,206	98,235	123,278	17,910	38
Foreign	470	41,956	134,293	166,033	114,402	74,346	5,496	34
State	1,803	108,697	267,442	286,239	212,637	197,624	23,406	72

2. NUMBER OF CHILDREN LIVING FOR EVERY MARRIED WOMAN BY AGE GROUPS.

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.
Native	0.42	1.11	1.83	2.13	2.28	2.43	2.60
Foreign	0.40	1.36	2.93	3.73	3.63	3.23	3.04
State	0.41	1.20	2.29	2.83	2.85	2.67	2.69

3. NUMBER OF CHILDREN LIVING FOR EVERY WOMAN BY AGE GROUPS.

NATIVITY.	14-19.	20-29.	30-39.	40-49.	50-59.	60-79.	80 and over.
Native	0.01	0.50	1.44	1.80	2.00	2.19	2.32
Foreign	0.02	0.98	2.38	3.36	3.37	3.02	2.89
State	0.02	0.53	1.80	2.46	2.56	2.44	2.43

* Calculated from Census of 1885, vol. i., part 2, pp. 1174-1181.

the large proportion of children among the natives. The computation of special death-rates for the different age groups would probably show, on the whole, a smaller mortality for the natives than for the foreign born. That, however, cannot be proved.

II. In the biennial period from 1888 to 1889 the natives born in Massachusetts, the Irish, and the natives of the other New England states, have a very high general death-rate, the natives of the other states, and especially the English Canadians, a very low one. But these statistics ought to be much improved and enlarged before they admit of drawing final conclusions.

III. At the census of 1885 the average number of children living for each woman living in wedlock or having been married was nearly four-sevenths higher for the foreign born than for the natives. That difference is smaller than for the children born, the average number of children born having been two-thirds higher for the foreign married than for the natives. The differences are again especially high for the age groups between thirty and sixty years.

IV. At the census of 1885 the average number of children living for every married woman was the smallest for the natives. It was more than one-half higher for the Germans, two-thirds higher for the Irish, and nearly twice as high for the French Canadians.

V. CONCLUSION.

1. *Propagation.*

In the preceding chapters it has been stated that the nuptiality and the fecundity of the natives was considerably behind that of the foreign born, while an essential advantage in regard to the mortality of the former could not be found. The result is that, besides the large increase of the foreign born through immigration, the

natural increase of the foreign born was much stronger than that of the natives. The natives, then, as a result of their deficiency in propagation alone, would be in a state of permanent relative decrease. The question which suggests itself now is: Do the natives also decrease absolutely? Is their nuptiality, fecundity, and mortality such that they cannot hold their own? Unfortunately, the statistics of Massachusetts are not such as to allow of a conclusive examination of the question. There is a temptation, undoubtedly, to seek an answer through a comparison of the births and deaths. But, firstly, much care must be observed in finding the births and deaths which should be compared. In view of the strange attempts which have been made in this direction, it is, perhaps, not superfluous to state that it would be absurd to compare the native births with the native deaths, as the native births are the births in Massachusetts of native parentage, while the native deaths include the deaths of the persons born in all the states of the Union, both of native and foreign parentage. A comparison of the total births with the deaths of natives of Massachusetts, as well as a comparison of the native births with the deaths of persons born of Massachusetts parentage, although being more logical in itself, would not afford a valuable result, as the native population is not a population growing out of itself, but partly by the births of foreign born women. That is also the reason why the most correct analysis of the natural increase of the native population between the two censuses could not afford a solution of the question. In the same way the number of children born and children living for each adult and each married woman could not give indications necessarily trustworthy.

The only scientific method of investigating the question of whether the natives can hold their own is the construction of tables of fecundity based on tables of mortality after the model Boeckh has introduced in the municipal

statistics of Berlin. It is, of course, wholly impossible to make similar computations for Massachusetts, as the elements of vital statistics indispensable for that calculation are the deaths by years of age, the excess of emigration and immigration by years of age, and the births by years of age of the mothers. But as the tables of fecundity of Berlin show that, with an annual special birth-rate of ten for every one hundred women in child-bearing age in 1891-95, the births were one-ninth behind the number necessary to keep the population of Berlin stationary,* it is probable that the native population of Massachusetts with a special birth-rate of 6.3 births for 100 adult women in child-bearing age, and a mortality of the female sex not correspondingly lower than that of Berlin, can not only not hold its own, but is dying out at a considerable pace.

2. General Conclusions.

The main conclusions to be drawn from the whole study may be formulated as follows:—

I. At the three censuses of 1885, 1890, and 1895 the proportion of native adult men living in wedlock was three-fifths, that of the foreign born, two-thirds; the proportion of the native adult women living in wedlock was six-thirteenths, that of the foreign born seven-thirteenths. These differences are even greater for both sexes in the reproductive period of life (1895). At the census of 1885 the number of women who were married or had been married without having ever borne a child was one-fifth among the natives and two-fifteenths among the foreign born. The proportion was but one-ninth among the women born in Germany, French Canada, and Ireland. The average number of children born to every foreign born married woman was two-thirds higher than for the natives. It was four-sevenths higher than for the na-

* *Statistisches Jahrbuch der Stadt Berlin*, 24 Jahrgang, pp. 58, f.

tives among the German women, six-sevenths higher among the Irish women, and more than twice as high among the women born in French Canada. The average number of children living for every married woman was three-fifths higher among the foreign born than among the natives. It was more than one-half higher for the women born in Germany, two-thirds higher for the Irish women, and nearly twice as high for the French Canadians. All these differences between the natives and foreign born are especially large in the reproductive age of life. The fact that the proportion of single among the adult natives was more than two-fifths, and among the foreign born less than one-third, while it was not much less than one-half for the natives of Massachusetts, only a quarter for the natives of the other New England states, and only two-elevenths for the women born in Germany, makes the total adult women natives of Massachusetts even less prolific; while the natives of the other New England states approach more nearly the average of the adult women, and the prolificness of the adult German women is still greater.

II. In the quinquennial period from 1888 to 1897 the special marriage-rate of the foreign born adult men is one-ninth, that of the women three-tenths higher than that of the adult natives. The special marriage-rate (1887-89) of the adult is smallest in the case of the natives of New England and the Irish. While it is rather high for the native males born outside of New England, it is very low for all native women. The refined marriage-rate of the not married adult foreign born men exceeds that of the natives by three-tenths: that of the foreign born women exceeds that of the native women by one-half. These differences are still greater in the reproductive age groups (1887-89). In the quinquennial period from 1888 to 1897 the special birth-rate of the adult foreign born women is more than twice as high for the foreign born than for the natives. It is especially low for the natives

of New England, and still lower for those born outside of Massachusetts than for those born in Massachusetts (1887-89). In the quinquennial period the refined birth-rate of the foreign born married women is four-fifths higher than that of the natives. The refined birth-rate of the foreign born married women of child-bearing age is seven-tenths higher than that of the natives (1898-97). In the decennial period from 1888 to 1897 the general death-rate of the natives is nearly one-fifth higher than that of the foreign born. The mortality of the natives calculated by age groups would probably be less for the natives than for the foreign born.

III. It is probable that the native population cannot hold its own. It seems to be dying out.

IV. The statistics of Massachusetts available for an investigation of the prolificness of the native and foreign born population are far from being sufficient. The minimum to be asked is an annual statement of the native and foreign born brides and grooms by years of age, the births of native and foreign born women by years of age of the mothers, and the deaths of native and foreign born by sex and years of age. All these data have to be given at least by five-year age groups for the countries of births corresponding to the classification observed at the censuses.

The Labor Bureau of Massachusetts had the high merit of publishing for the *Census of 1885* a detailed presentation of the number of childless women and the number of children for every married woman.* It is to be regretted that this publication has not been repeated in connection with the *Census of 1895*. At the federal census of 1890 the necessary questions were asked, but no data have been published. All the necessary questions have been asked at the federal census of 1900. It is to be hoped that the rich material thus secured will be made accessible by a very detailed presentation.

R. R. KUCZYNSKI.

*This line of work was originally introduced in the *Census of 1875* and enlarged in the *Census of 1885*.

EXCISE TAXATION IN PORTO RICO.

THE financial experience of Porto Rico under the American flag has been described in some detail by the present writer in another connection.* In the fiscal reconstruction of the island an important part has been played by a system of excise taxation, levied in lieu of the internal revenue taxes of the United States, for the benefit of the insular instead of the federal treasury. The introduction and operation of these excise taxes seem to present features important and instructive enough to warrant an independent account, and this is the purpose of the following pages:

I.

During the Spanish régime excise taxation in Porto Rico consisted of insular stamp taxes on transfers of property, legal instruments, and commercial paper, and local *consumo* taxes, or *octrois*, upon food-stuffs, collected by each of the sixty-six or more municipal districts into which the island was divided, at rates and in categories varying with the financial needs and the local policies of the respective districts. Among the earliest acts of the military government, established upon the transfer of the island to American control on October 18, 1898, was the repeal of the insular stamp taxes and the abolition of municipal *consumo* taxes upon articles of necessary consumption. Like much of the negative legislation of the early military government, this action, taken in accordance with the recommendation of a native "council of secretaries," reflected the humanitarian impulse of the

* "The Finances of Porto Rico," *Political Science Quarterly*, December, 1901.

soldier rather than the reasoned judgment of the administrator. At the time of repeal the insular stamp taxes were in successful operation, yielding considerable revenues without imposing an onerous burden upon any particular class, and were actually less extensive than existent internal revenue taxes on similar transactions in the United States. The voluntary sacrifice of so important a source of insular revenue can only be comprehended in the impression then apparently prevalent, that *derechos reales* were a manner of oppressive "royal dues" inconsonant with the new sovereignty. Similarly, the abolition of the numerous *consumo* taxes on prime necessities fell far short of the benevolent end contemplated. In Porto Rico the economic relations of retail trade are determined by custom rather than by competition; and the sudden removal of *octrois* simply resulted in increased profit to the retailer rather than in reduced cost to the purchaser. The municipal treasuries were depleted, and a minimum benefit was derived by the consumer. It is highly improbable that *consumo* taxation would have been retained in the ultimate financial reorganization of the island; but the sweeping repeal at the beginning of American administration was premature, and simply operated to rob Peter, in the form of the municipal treasuries, without paying Paul, in the guise of the native consumers.

Once repealed, general administrative policy rendered impracticable the reimposition, even temporarily, of *consumo* taxes on necessary food supplies. Existing local *octrois* on alcoholic beverages and cigarettes remained unaffected, and in some instances thereafter these schedules were extended and the rates increased. But such action was unusual and spasmodic. In the main, the municipal districts, deprived of their largest sources of revenue, without substitutes of any kind, were left to drag out an inadequate and insecure fiscal life.

The ruinous hurricane of August 8, 1899, and the con-

sequent occasion for public relief measures, brought the financial necessities of the municipal districts to the front, and the military government sought to provide therefor in General Orders, No. 176, of November 7, 1899, by imposing a series of local license taxes and fees upon vehicles, public conveyances, dogs, placards, pawn-shops, and public entertainments. Of greater interest in the present connection were the imposition, by the same measure, of a stamp excise of three cents per litre upon alcoholic liquors manufactured in Porto Rico, and one of one-tenth of a cent per box on matches manufactured in Porto Rico, subsequently extended (General Orders, No. 187, of November 25, 1899) to all matches imported into the island. The proceeds accruing from these two taxes, which were entirely independent of existent *octrois* and were made payable by the affixture of stamps by manufacturers and importers, were appropriated to the municipal districts to be apportioned quarterly, upon the basis of population, by the insular civil secretary, in whom was vested the administration and enforcement of the taxes.

Social rather than fiscal considerations led to the imposition of an insular excise of two cents on each pound of imported oleomargarine on November 29, 1899 (General Orders, No. 196), and of a similar tax of twenty cents on each imported pack of playing cards, on December 30, 1899 (General Orders, No. 232). These latter taxes were paid by the importer at the custom-house, without the affixture of stamps; and the proceeds accrued directly to the insular treasury.

The excise taxation of the military government — if the heterogeneous imposts described above can be so characterized — is of interest because of its fragmentary, defective quality rather than of its intrinsic importance. Evidently suggested by corresponding features of the internal revenue system of the United States, the four excises stood in no relation either to the financial possibilities or to the

social conditions of Porto Rico. Their administrative enforcement was intrusted to an over-burdened department, —namely, the civil secretary's office; and the results, which even under the most favorable circumstances would have been disappointing, were all the more unsatisfactory. By administrative regulation the tax on alcoholic liquors was made payable by the affixture of stamps to the bottles or vessels wherein sold. No inspection force was provided; and every variety of fraud, ranging from the re-use of the stamps to the entire neglect of the tax, was practised. The district courts of the island were given jurisdiction over excise violations, but the natural delay in Spanish judicial procedure was heightened by administrative neglect in referring cases for prosecution. The general order imposing the excise on matches directed the civil secretary to prescribe a time during which stamps must be affixed to all stocks of matches. This notice was never given; and, in consequence, fraud was freely practised by the declaration thereafter that unstamped matches had been in stock at the time of the passage of the law. The tax on oleomargarine, being reasonable in amount and paid at the ports of entry, was collected without serious difficulty, but yielded an unappreciable amount. The tax of twenty cents on each pack of playing cards was a fiscal impossibility. The playing cards used in Porto Rico cost about five cents per pack, and the excise of twenty cents simply destroyed all legitimate trade therein and put an additional premium on smuggling.

In February–March, 1900, the anxiously awaited Congressional legislation with respect to Porto Rico broadened from the tariff bill originally contemplated into an organic measure, better known as the Foraker Act, establishing civil government in the island. In the ordinary course of events it is probable that the Foraker Act would have extended to Porto Rico the body of internal revenue laws of the United States or a fixed percentage of the rates

of taxation prevailing thereunder. Certain substantial interests in Porto Rico, intent upon at once securing free trade with the United States regardless of the larger social cost, noisily advocated such a course, subject to the condition — implied rather than expressed — that the proceeds should be appropriated in support of the insular government.

To the present writer, then acting under commission of the Secretary of War as special commissioner to revise the laws relating to taxation in Porto Rico, this policy seemed eminently unwise and inexpedient. The United States system of internal revenue taxation presented itself as the result of a gradual development in an economically advanced community. To apply this system in any degree *en bloc* to Porto Rico, where social and economic elements are radically different, appeared certain to result in financial failure and economic friction. It was manifest that excise taxation should play an important part in the ultimate revenue system of Porto Rico, but every consideration of prudence suggested that it should be of a kind suited to the insular environment. The element of efficiency in the system prevailing in the United States invited reproduction in Porto Rico; but the objects taxed, the rates imposed, and the methods of collection should be in conformity with local characteristics.

The foregoing views — conveyed in a formal recommendation of the special commissioner to the military governor — were adopted by General Davis, transmitted to the Secretary of War, and were instrumental in securing the insertion, in the act of Congress establishing civil government, of the provision that the internal revenue laws of the United States should not be extended to Porto Rico, thus leaving the way clear for the ultimate adoption of a system of insular excise taxes.

II.

The establishment of civil government on May 1, 1900, vested the administration of the insular revenue system — and with it the enforcement of the insular excises — in the hands of the newly appointed treasurer. The general orders of the military government were at the same time constituted statutory enactments, and all power to alter, amend, or repeal their provisions conferred upon a prospective insular legislature. No possibility thus existed of correcting the essential defects of the excise taxes until the legislative branch of the civil government could be fully organized. Wider latitude seemed to exist with respect to the administrative regulations issued by the civil secretary; but, in actual practice, these had assumed much of the rigidity of the military legislation, and any essential modification threatened serious disturbance and inconsiderable gain.

Under these conditions it became the definite policy of the civil administration to enforce rigidly the excises as then existing, with a view at least to developing such a degree of popular respect for insular revenue laws as to insure the prompt adoption and successful operation of a rational system of excise taxation whenever this should become practicable. The conspicuous need of the situation was effective field inspection, of which there had been nothing whatever during the military government. Accordingly, one of the first acts of the treasurer under the civil government was the organization of a bureau of internal revenue agents, followed in turn by the division of the island into inspection districts, the designation of eight tax examiners for temporary service in connection with the assessment of insular direct taxes, and the appointment of one internal revenue agent at large for the enforcement of the excise taxes. This agent at large visited all of the merchants and manufacturers in San Juan,

and then, in rapid succession, made similar inspection visits to the two other important cities of the island, Ponce and Mayaguez. This was succeeded by a systematic tour of the island, in which every municipal district of the island was visited, ignorant delinquents were warned of defaults, and indictments, or *expedientes*, were instituted against deliberate defrauders. By the end of July, 1900, the tax assessment rolls of the island were in the main completed, thus permitting the discharge of the tax examiners and the reorganization of the inspection work of the bureau of internal revenue agents. For this purpose the island was divided into four inspection districts, and an internal revenue agent stationed in each, charged primarily with the detection of frauds committed by distillers of rum, practically the only alcoholic production of the island, and by manufacturers of matches in failing to affix revenue stamps to wares shipped from their factories. An official was also stationed at the San Juan custom-house, and charged with the duty of cancelling and affixing revenue stamps to imported beers, wines, liquors, matches, oleomargarine, and playing cards in payment of the respective excises levied thereon. In the sub-ports the deputy collectors of customs, through the courtesy of the collector of customs for Porto Rico, undertook to cancel and affix stamps to wares subject to excise taxation.

Not until the effort was made to secure exact observance of the excise taxes did it become fully apparent how general and extensive was their violation. This was particularly true of the excise on rum, from which the largest revenue might be derived. Rum in Porto Rico is usually shipped from the distillery in hogsheads and demijohns. On arrival at its destination—and every wayside provision booth on the island is a grog-shop—the hogshead or demijohn is decanted into fixed casks, jugs, and other receptacles, which under the old law did not

require to be stamped, and then returned to the distilleries. The original hogsheads and demijohns were often returned with old stamps still affixed, but more frequently with such stamps carefully removed and transmitted in separate enclosure, to be reaffixed to the identical package when refilled. Internal revenue agents captured many sheets of such stamps, old veterans, worn to a frazzle from repeated use. There was no law to fit the case, no obligation on the part of the distiller to destroy cancelled stamps, no offence incurred in removing them from packages for re-use, nor in keeping them in possession with this end in view. The isolated location and rambling construction of the ordinary distillery rendered any satisfactory surveillance of its operations impracticable. The perpetration of fraud was congenial to the petty smartness of the small dealer, and the sympathy of the neighborhood with cheap rum rendered the defrauder reasonably secure from detection. Local officials were not infrequently in direct collusion with fraud, and on one occasion eight hogsheads of rum bearing twice-used stamps were captured while being conveyed late at night to the liquor factory of the municipal judge in a town on the northern coast of the island.

Contempt for the law pervaded every class of the population. The liquor-loving peasant in the rural districts sat up at night soaking the stamps off his bottle of rum to be stuck on the next bottle he bought; and the army officer in charge of the post canteen had resort to the United States District Court to test the propriety of denominating beer an alcoholic beverage. Boys peddled cancelled stamps at an inconsiderable discount from their face value, and, if detected and the stamps confiscated, no provision of the excise law was applicable for their punishment. In certain localities cancelled stamps indeed served as a minor circulating medium, available for re-use until worn to tatters; and specimens thereof were actually

presented for redemption when the operation of the new revenue act led to the recall of the old series of stamps.

Open defiance of the law was not unknown. On several occasions internal revenue agents were mobbed; and in one notable instance two agents were severely clubbed, and one of them put in jail. On another occasion an agent was arrested and accused before the local municipal judge of accepting a bribe from a law-breaker. When the chief of internal revenue agents, promptly sent by the treasurer to investigate the case, arrived in town, he found the alleged bribe-taker closely guarded in his hotel by two municipal policemen; while the mercantile fraternity were busily engaged in plastering internal revenue stamps on liquor packages, the stamps having been hurriedly obtained from the nearest collector of internal revenue. The agent was acquitted at the next term of the district court, it appearing that the evidence against him, as well as the stamps, had been procured for temporary use only.

And yet the limited force of internal revenue agents was not idle, and the results of the inspection was seen in marked increases in the sale of stamps. Several hundred cases of fraud were detected and referred by the treasurer, through the attorney-general, to various district courts for prosecution. The moral benefit of such action was largely reduced because of the delay on the part of the district courts in rendering decisions. Ultimately, most of the influential defrauders were acquitted; and about two-thirds of the remaining accused were found guilty, and fined in small amounts. In the main, evasion and fraud remained undiscovered,—results due in large measure to the structural defects of the excise laws and their accompanying regulations.

In one direction only was conspicuous progress made,—the organization of an inspection force. Under the old régime, tax inspection had been synonymous with extor-

tion and blackmail; and dire consequences had been prophesied upon the organization of the bureau of internal revenue agents. In actual fact the beneficial results obtained more than justified every reasonable expectation. Carefully selected at the outset, the inspection force was gradually sifted and refined until sound traditions had been established and a really remarkable *personnel* evolved. Not many months had elapsed before it had become definitely understood in every part of the island that minute tax inspection was not necessarily identical with bribery and blackmail, and that the contrary assumption as a working hypothesis was dangerous.*

III.

Two distinct problems thus presented themselves in considering the place of excise taxation in the financial reorganization of the island. The first was legislative, and involved the determination of the objects to be taxed and the rates to be imposed. The second was administrative, and concerned the methods of collecting and enforcing the taxes when imposed. The quality of the proposed excises had from the outset been carefully studied in the light of the economic resources and the financial requirements of the island by the bureau of tax law revision, created to continue in the treasury department the work

* This result was in large measure due to the peculiar fitness and efficient service of the person appointed chief of internal revenue agents, and intrusted with the organization and conduct of the force,—Mr. John S. Hord. Originally detailed by Military Governor Davis to aid the special commissioner to revise the laws relating to taxation in Porto Rico, Mr. Hord showed such unusual qualifications that, upon the organization of the treasury department under the civil government, he was promptly placed in charge of the newly established bureau of internal revenue agents. Long residence on the Texas and Mexican frontiers and continued experience in various responsible capacities on both sides of the Rio Grande afforded admirable equipment for the work in Porto Rico. Not only was his service important in organizing the original inspection force; but his influence contributed to shape the new system of excise taxation; and his hand controlled and, fortunately, still controls its administrative enforcement.

begun by the special commissioner to revise the laws relating to taxation.

It seemed clear that the heterogeneous local *consumo* taxes, varying widely in categories and in rates, should be replaced by unified insular excises, some part of the proceeds of which should temporarily accrue to the municipal districts in lieu thereof. Alcoholics and tobacco naturally presented themselves as the most appropriate objects of excise taxation in Porto Rico, being both in harmony with the financial practice of the United States, as represented by the internal revenue system, and with the traditional policy of Porto Rico, as embodied in *consumo* taxation of rum and cigarettes. Both articles offered a safe taxable margin, whether viewed from the standpoint of the producer or of the consumer. Rum, the important alcoholic drink of the island, is the by-product of sugar production; and this industry, of all others, was able to bear high taxation because of the virtual bounty offered by existent and prospective trade relations with the United States. Tariff reductions on trade with the United States offered a similar favoring differential to the tobacco manufacturer, and a reasonable excise threatened neither curtailed nor unprofitable production. On the other hand, the interest of the consumer was not seriously endangered. Excessive rum consumption is a curse of the island, and a possible effect of the excise in reducing the frequency or the strength of the peon's potation was not unwelcome. Manufactured tobacco, cigars, and cigarettes were already selling in Porto Rico at the higher price fixed by the New York market, and would probably be inappreciably affected by moderate insular taxation. Finally, experience had made clear that custom rather than competition determined retail prices in Porto Rico; and it seemed likely that the actual incidence of reasonable excises would be upon the prosperous retail dealer as much as upon the consumer.

In addition to these important revenue-producing items, matches, playing cards, fire-arms and ammunition, oleomargarine, and proprietary medicinal preparations invited reasonable taxation, both for fiscal and for regulative purposes. The documentary taxes of the United States and the success of the old *derechos reales* in Porto Rico suggested light stamp duties on certain legal instruments and commercial papers. For purpose of regulation and administrative control the licensing of dealers in and importers of articles subject to excise taxation seemed desirable.

A schedule of excise taxes, as thus outlined, was included in the general revenue bill submitted to the insular legislature, and emerged as Title II. of the act of the legislative assembly of Porto Rico, approved January 31, 1901, being "An act to provide revenue for the people of Porto Rico and for other purposes." In passage through the legislature the original schedule underwent numerous amendments and modifications, but of minor importance, with two unfortunate exceptions. These were (1) an increase of the excise on oleomargarine to a prohibitive rate, and (2) elimination of the provision imposing a light specific tax in lieu of the excise in the case of petty hand-workers in cigars and cigarettes. As actually passed, the following taxes were imposed:—

SCHEDULE A.

Par. 1.	Rum and bay rum produced in Porto Rico or imported from the United States	\$0.60 per gallon
	Rum and bay rum imported from foreign countries	1.00 " "
	Other distilled liquors . . . . .	.80 " "
Par. 2.	Adulterated distilled liquors . . . . .	.40 " "
Par. 3.	Wines and beers . . . . .	.15 " "
	Champagnes	1.00 " "
Par. 4.	Adulterated wines and beers . . . . .	.15 " "

Par. 5-8.	Cigars and cigarettes produced in Porto Rico or imported from the United States:	
	Not exceeding three pounds per thousand in weight	\$1.00 per thousand
	Exceeding three pounds per thousand in weight	1.80 " "
	Cigars and cigarettes imported from foreign countries:	
	Not exceeding three pounds per thousand in weight	2.00 " "
	Exceeding three pounds per thousand in weight	3.60 " "
Par. 9.	Manufactured tobacco produced in Porto Rico or imported from the United States . . . . .	.05 " pound
	Manufactured tobacco imported from foreign countries . . . . .	.10 " "
Par. 10.	Playing cards . . . . .	.02 " pack
Par. 11.	Medicinal preparations	5% ad valorem
Par. 12.	Oleomargarine . . . . .	.10 per pound
Par. 13.	Arms and ammunition	25% ad valorem
Par. 14.	Matches produced in Porto Rico or imported from the United States . . . .	.15 per hundred boxes (100 sticks per box)
	Matches imported from foreign countries,	.30 per hundred boxes (100 sticks per box)

SCHEDULE B.

Par. 1.	Wholesale dealers in distilled spirits . .	\$80.00 per annum
Par. 2.	Wholesale dealers in fermented liquors .	40.00 " "
Par. 3.	Retail liquor dealers:	
	1st class	30.00 " "
	2d "	12.00 " "
	3d "	5.00 " "
Par. 4.	Wholesale dealers in tobacco	40.00 " "
Par. 5.	Retail tobacco dealers:	
	1st class	12.00 " "
	2d "	8.00 " "
	3d "	4.00 " "
Par. 6.	Dealers in arms and ammunition	24.00 " "

SCHEDULE C.

Par. 1.	Bills of lading	\$0.10 " copy
Par. 2.	Entries of imports from the United States,	.50 " "
Par. 3.	Entries of imports from foreign countries,	1.00 " "
Par. 4.	Notarial instruments and documents of record . . . . .	.50 and 1.00 per copy

All the foregoing taxes were made payable by the affixture and cancellation of internal revenue stamps, and the treasurer was authorized "to make such rules and regulations as may be necessary for the affixture and cancelling of such stamps." Manufacturers and importers were required to furnish bond, conditioned on the faithful compliance with the law, which should in no case exceed in amount 50 per cent. of the annual value of their manufactures or importations; and failure to provide such a bond was made punishable by a fine of from \$100 to \$1,000, or to imprisonment from one month to one year. Provision was made for the increase of the corps of internal revenue agents, who were authorized to take oaths and to certify to declarations, and were vested with all the powers possessed by internal revenue agents of the United States treasury department, for the purpose of investigating stocks of goods subject to excise taxation, and to examine books and accounts current relating thereto. Manufacturers and importers who failed to affix and cancel stamps as required by law were liable to a fine of from \$100 to \$1,000, or to be imprisoned from one month to one year; and merchandise on which taxes had not been thus paid was to be confiscated.

Persons found guilty of the offence of forging or counterfeiting internal revenue stamps, or of erasing the marks of cancellation on stamps which had been used, or who sold, bought, or used such counterfeit stamp or stamps from which the cancellation marks had been removed, or who were found in the possession of any such stamps, were liable to a fine not to exceed \$1,000, or to imprisonment for a term not to exceed five years, and, in addition, all articles for the payment of which such stamps were used were confiscated.

The treasurer was authorized to provide collectors of internal revenue and internal revenue stamp agents, appointed for the sale of such stamps, with a sufficient

amount of stamps to supply the needs of manufacturers and importers in each locality. Municipal districts were prohibited from imposing *consumo* taxes other than dealers' license taxes on articles subject to an insular excise; and in lieu thereof the treasurer was directed to apportion monthly among the municipal districts of the island, upon the basis of population, 50 per cent. of the proceeds of the new excise taxes until June 30, 1901, and 15 per cent. thereafter. Articles of domestic manufacture exported to the United States or to other countries were exempt from excise taxation in conformity with rules and regulations to be prescribed by the treasurer.

The estimated yield of the schedules, when fully established, calculated upon the basis of sworn declarations of manufacturers and importers as to actual manufactures and importations for 1900, and as to anticipated activities in 1901, was as follows: *—

Distilled spirits:		
Domestic	\$528,750.00	
Imported	17,100.00	\$545,850.00
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Adulterated spirits		27,950.00
Beer and wine, imported		22,310.00
Cigars, domestic	\$30,000.00	
Cigarettes, domestic	115,000.00	
Manufactures of tobacco	2,500.00	147,500.00
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Playing cards, imported		10.00
Proprietary medicinal preparations, imported		2,050.00
Oleomargarine		850.00
Arms and ammunitions, imported		1,640.00
Matches:		
Domestic	\$10,960.00	
Imported	2,460.00	13,420.00
<hr/>		
Total		\$761,580.00
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On domestic manufactures		\$715,160.00
On imports		46,420.00
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Total		\$761,580.00

*This estimate assumed that underestimates of manufacturers and importers with respect to 1901 would offset the amount of exports exempt from the excise.

SCHEDULE A, manufactures and imports	\$761,580.00
SCHEDULE B, dealers' licenses	60,000.00
SCHEDULE C, documentary	20,000.00
Total	<u>\$841,580.00</u>

IV.

The revenue act fixed the categories and rates of excise taxation, but provided that the treasurer should issue rules and regulations necessary for the operation of the system. The experience of the military government had demonstrated that, no matter how judicious were the essential provisions of the law, the system itself would be doomed to failure unless its administration was suited to peculiar local conditions. In anticipation of such action the most careful preparatory study had been made by the treasury department of the best method of collecting and enforcing the excises. A successful body of administrative regulations seemed to demand the following requisites:—

1. The method of collection and enforcement must be effective, but simple and consistent, and intelligible in its essentials to even the most ignorant tax-payer.
2. Provision must be made for the general assessment of all distillers, cigar, cigarette, and match manufacturers, and importers of taxable articles; and exact report must be required of annual production or importation, stock on hand, daily manufacture and shipment, and excise stamp purchases.
3. The old issue of internal revenue stamps must be withdrawn, and a new series of convenient denominative values substituted therefor.
4. The fraudulent re-use of stamps must be prevented by their actual destruction upon the payment of the excise.
5. A simple method must be devised for the payment in instalments of the license taxes imposed by Schedule B.

6. The enforcement of the system must be vested in an adequate corps of Spanish-speaking American internal revenue agents, susceptible neither to intimidation nor to improper influences.

These several features seemed more likely of attainment by adopting certain administrative features of the Mexican *la ley del timbre* rather than by reproducing the methods of the United States internal revenue system, and by requiring the payment of excise taxes to be evidenced by affixing stamps to accompanying invoices so as to absolutely prevent re-use instead of attaching them to the articles liable to the tax, to be destroyed by the purchaser upon consumption or use.

This conclusion was reached some two months prior to the actual passage of the revenue act by the insular legislature. The interval was devoted to busy preparation for the prompt inauguration of the new system, in anticipation of the likelihood that the excise taxes would go into immediate effect. The four district internal revenue agents then in service were directed to prepare and transmit to the treasurer's office a list of the names and residences of all distillers, match, cigar, and cigarette manufacturers on the island, and of the importers of any of the articles subject to the tax. The agents were also directed to estimate the number of dealers in each municipality within their respective inspection districts liable to the license taxes imposed in Schedule B, and to report the names of all notaries public, owners or agents of ocean-going ships, and of all exporters and importers through whom or by whom documentary taxes imposed in Schedule C should be paid. All of this data was obtained and made available prior to February 1, 1901, in the shape of preliminary assessment rolls and maps showing the location of every distillery and tobacco factory on the island. Each of the four inspection districts was partitioned into three divisions of from three to seven

municipalities to a division, due regard being had in this distribution that the areas and number of tax-payers should be as uniform as possible in the twelve divisions. To recruit the force of internal revenue agents up to a full complement, eight of the best types from among over forty applicants were selected and placed on the waiting list. Upon the passage of the revenue act authorizing the appointment of additional agents, these eight additional men were appointed and detailed to their respective divisions. The corps of internal revenue agents, as thus organized, was composed almost entirely of ex-engineers of the board of public works, who had been engaged in road building in various sections of the island and of ex-non-commissioned officers of the regular army. All were fearless, hardy campaigners, and most had seen military service in Porto Rico or elsewhere.

A new series of internal revenue stamps, consisting of surcharged United States internal revenue documentary stamps, was secured through the courtesy of the United States treasury department in Washington, and preparation made to issue them, in lieu of the crude series then in use, upon the inauguration of the new system. Bonded stamp agents, usually the postmasters, were appointed in all important towns of the island, and steps taken to make available adequate supplies as soon as required.

In the same way a large amount of anticipatory work was done in preparing necessary return blanks, forms, bonds, instructions, and stub invoice and register books designed for use in administering the new system. All such forms as would be unaffected by possible legislative changes were printed, or mimeographed, and stored away for ready use. The forms for the stub invoice and register books were ready, and the proof corrected, two weeks before the act became a law.

Within a few hours after the revenue act had been signed by the governor of Porto Rico on the night of

January 31, 1901, to go into effect as far as the excise taxes were concerned from the date of its passage, the brief of the excise schedules was corrected to agree with the legislative amendments made at the eleventh hour, and inserted in Spanish and English in the *Official Gazette*. The summary of the law for use on the back of invoices was similarly corrected, the stereotypes cast, and the presses in motion, striking off three thousand stub-invoice books and fifteen hundred register books. The old internal revenue agents were called in, and the new agents were appointed, mounted, and equipped. The invoice and register books were stamped with the proper paragraph, assessment, and page numbers taken from the preliminary rolls; and within a week from the time the law went into effect over one-half a ton of books, blanks, and regulations were distributed to the remotest corners of the island, and the entire corps of internal revenue agents was busily engaged in furnishing books to tax-payers and in acquainting them by patient specific instructions with the details of the law. A few weeks later the distribution of license blanks for the payment of taxes imposed by Schedule B was completed; and bonds duly signed and attested, conditioned on the faithful observance of the law, were received from all manufacturers and importers liable for payment of the tax.

V.

The excise taxes of Porto Rico accrue upon the shipment of the articles liable from the factory or upon their withdrawal from the custom-house, and are evidenced by the affixture, in prescribed form, of internal revenue stamps of requisite amount to an invoice accompanying the shipment or withdrawal. For this purpose every manufacturer or importer of an article liable to the excise is provided, at nominal cost, with a stub-invoice book and

a register book, each containing fifty sheets. On the face of each invoice sheet is printed the form of certificate to be signed and of invoice to be filled in by the importer or manufacturer at the time of withdrawal or of shipment, together with full instructions for the guidance of manufacturers, importers, carriers, and consignees. On the back of each sheet are printed the several rates of taxation and essential abstracts from the revenue act.

The invoice sheet contains blank spaces, in which are stamped the schedule and paragraph numbers of the particular article for which the book is used, and the assessment number of the particular tax-payer to whom the book has been issued. The invoice sheets in the initial book issued to a tax-payer are also numbered consecutively from 1 to 50, the second from 51 to 100, and so on, indefinitely. It will thus be seen that no two invoices for goods manufactured in Porto Rico or imported into Porto Rico can bear the same set of paragraph, assessment, and invoice numbers; and no goods liable to the tax can, under penalty of law, be shipped from factories or imported into the island unless an invoice for the same be first filled out on a proper invoice sheet. The insular police force co-operate actively with internal revenue agents in the detection of fraud, the seizure of illicit goods, and the arrest of delinquents.

The invoice proper is separated from the stub by two vertical lines, forming a column of the width of an internal revenue stamp. When an invoice has been filled out and signed by a manufacturer or importer, and an abstract thereof entered on the stub, revenue stamps to the full amount of the excise on such goods are affixed in the vertical column between the invoice and the stub, and are cancelled with the manufacturer's or importer's name and date of shipment from the factory or withdrawal from the custom-house. The invoice is next detached from the stub midway between the two vertical lines, so that each

stamp is destroyed by bi-section, one-half remaining affixed to the invoice and one-half to the stub. The manufacturer's or importer's name and invoice number are branded or marked on each package of goods contained in the invoice, and the stamped invoice itself is transmitted by the carrier with the goods to the consignee. At brief intervals an internal revenue agent visits each manufacturer or importer, takes notes from the invoice stub and the register book as to all shipments made, and then proceeds to collect from the consignees the stamped invoice sheets corresponding to the shipments thus entered. If the consignee lives in another inspection district, the agent of the latter district is informed by a regular card of notification; and he in turn collects the invoice sheet. All invoice sheets, with the mutilated stamps attached, are thus ultimately returned to the bureau of internal revenue to be audited and filed. In the cases of imported goods the stamped invoices are attached to the custom-house entries, which are forwarded from all of the sub-ports to the San Juan custom-house, where the stamped invoices are detached from the entries and also audited and filed in the treasurer's office. The stubs of exhausted invoice books are returned by agents to be filed; and new books, consecutively paged, are furnished tax-payers. By this simple method, revenue stamps once used in payment of excise taxes are cancelled, mutilated beyond all possibility of re-use, and the fragments actually removed from circulation.

In the register book, delivered with each initial invoice book, the manufacturer or importer is required to keep a daily record of his business operations. On one page are entered the stock of goods and the value of revenue stamps on hand at the receipt of the register book. On the opposite page are entered, under proper date and invoice number, the record of each shipment, including the character and value of merchandise, the carrier, destina-

tion, consignee, and the value of revenue stamps affixed to the corresponding invoice. Daily entry is also required of goods manufactured or imported, of the value of stamps purchased, and of the residence of the collector or stamp agent from whom purchased. The register book is balanced at the end of each month; and an exact transcript of the month's transactions, sworn to before the local internal revenue agent, is forwarded to the treasurer's office for filing. Collectors of internal revenue and internal revenue stamp agents are also required to forward monthly itemized statements of all stamps sold, giving in full detail the residence and name of purchaser, date of sale, for what purpose designed, and denominative value of each stamp sold. An efficient system of checks is thus provided, and means afforded of determining with absolute accuracy the amount and source of revenue collected monthly from each particular excise.

The enforcement of the taxes imposed by Schedules B and C—all of which are paid by the affixture and cancellation of revenue stamps—presents no serious difficulties. Documentary taxes are familiar in Porto Rico, and the desire of the person liable to render the document perfectly legal and binding is an effective motive for the payment of the tax. The dealers' license taxes are due in quarterly instalments, and require some greater effort for efficient enforcement. The license blanks are stamped with the respective paragraph and assessment numbers, and are divided into four square spaces to which, successively, on the first day of each quarter, revenue stamps of requisite amounts must be affixed and cancelled. Every dealer liable receives from the revenue agent of his district annually an appropriate license blank, and quarterly an order upon the nearest revenue stamp agent for the necessary stamps. Upon purchasing the stamps, the dealer leaves the order slip; and this is returned by the stamp agent with his monthly report. In the bureau

of internal revenue the returned order slips are checked against detailed reports submitted by the internal revenue agents. Delinquent dealers are thus ascertained, and necessary measures taken to secure compliance with the law. A further check is afforded by the requirement that the license blanks be posted conspicuously, and by the inspection visits, at irregular intervals, of internal revenue agents.

VI.

At this time of writing,—January 1, 1902,—eleven months have passed since the introduction of the new system of excise taxation; and its operation can now be characterized as a conspicuous and unqualified success. The monthly receipts therefrom, classified with respect to (1) rum, (2) cigarettes, cigars, and manufactured tobacco, and (3) other taxes, have been as follows:—

<i>Month.</i>	<i>Rum.</i>	<i>Cigars, etc.</i>	<i>Other Taxes.</i>	<i>Total.</i>
February	\$9,952	\$8,146	\$5,512	\$33,610
March	14,580	13,085	5,763	33,428
April	24,326	16,814	8,540	49,680
May	23,290	19,492	20,364	63,146
June	24,659	19,885	10,006	54,550
July	30,918	18,326	21,581	70,825
August	33,180	20,153	11,507	64,840
September	30,215	22,336	8,938	61,489
October	41,305	20,181	18,636	80,122
November	39,674	19,262	13,882	72,818
December	50,515	20,344	11,894	82,753
Total	\$322,614	\$198,024	\$136,623	\$657,261

During the five months from February 1 to June 30, 1901, the normal yield of the excises was reduced by reason of the existence of large stocks of rum throughout the island, and by the conservative sentiment entertained by the native mind toward a rigid excise administration. The total amount collected during this period was \$224,414, or a monthly average of \$45,083. By the begin-

ning of the present fiscal year,—the period for which the estimates made above * had been prepared,—the important stocks of rum had been practically exhausted, and current purchases were being gradually resumed; the administrative details of the new system had become fully understood, and the penalties of fraudulent violation demonstrated; public sentiment, as embodied in the formal resolutions of commercial organizations and the expressed attitude of political parties, had crystallized in favor of an exact and cheerful compliance with the law; and the economic recovery of the island from the prostration of a disastrous hurricane and the disturbances of a change in monetary standard had begun to restore popular consumption to normal proportions.† During the first six months of the present fiscal year the total amount collected has been \$432,847, or a monthly average of \$72,141. The estimated yield of the excise schedule for the fiscal year ending June 30, 1902, is \$841,580, or a monthly average of \$70,132. Six months constitute an insufficient period for safe prophecy in financial matters as to a full twelvemonth. But, considering the facts at hand and the tendencies now evident, there seems full reason to suppose that, with no disturbing factor or unexpected occurrence, the aggregate estimate for the fiscal year will be realized.

Pari passu with the secure establishment of the excise system and the increased yield therefrom, the percentage cost of assessment, inspection, and collection to the gross revenue derived has declined as follows: February, 10.8 per cent.; March, 9.5 per cent.; April, 5.8 per cent.; May, 5.2 per cent.; June, 7.03 per cent.; July, 4.3 per

* Page 15.

† Thus the excise on rum produced about 35 per cent. more in October than in September; and the much larger part of the \$11,090 increase came from the coffee districts of the island, where this year's crop, now being harvested, is reported to be almost as large, in certain sections at least, as in the years preceding the hurricane.

cent.; August, 4.05 per cent.; September, 5.06 per cent.; October, 4.05 per cent.; November, 3.09 per cent.; December, 3.08 per cent. The exemption of exports from the excise has accented the removal of customs duties on imports into the United States from Porto Rico, and has stimulated an important Porto Rican export trade in the commodities liable to the insular excise. From February 1 to July 25, 1901, when free trade between Porto Rico and the United States went into effect, there were exported from Porto Rico to the United States: rum and bay rum, 11,046 gallons; cigars, 9,483,793; cigarettes, 788,700. From July 25 to October 31—five weeks more than the preceding period—the corresponding movement was: rum and bay rum, 78,087 gallons; cigars, 19,570,363; cigarettes, 6,576,800.

The qualitative effects of the new system have been no less distinctly successful than its quantitative results. For the first time in the history of Porto Rico a system of taxation is in operation of which evasion, fraud, bribery, and blackmail are not essential parts. The excise regulations of the island are beginning to command something of the same popular respect entertained towards postage and currency laws, and a tonic quality has thus been imparted to the insular administration as a whole. The incidence of the excise taxes has been in large part upon the retail dealer, who, better perhaps than any element in Porto Rico, is able to make an increased contribution to the support of the government. To the limited extent that the consumer has been affected, it is in the direction of luxurious or injurious rather than of necessary consumption. It seems entirely reasonable to state that the system has injured no industry, has curtailed no production, has burdened no consumer, and that its enforcement has been efficient and its acceptance general.

The estimated expenditures of the insular government for the fiscal year ending June 30, 1902, are something

under two million dollars. Excise taxation during this period is expected to contribute \$715,343, exclusive of \$126,237 (being 15 per cent. of the gross receipts) which will be apportioned among the municipal districts. In addition to being the most important source of present revenue, the excise schedule possesses considerable elasticity with respect to future insular requirements. With increased production and growing prosperity the gross receipts will swell progressively. The reorganization of local government will enable the insular treasury to reclaim the quota now appropriated to the municipal districts in lieu of the abolished *consumo* taxes. The excise on beer and other alcoholics imported from the United States can properly be increased to compensate for the import duty removed. The substitution of an ad valorem for a specific excise on cigars, the reduction of the oleomargarine excise from its present prohibitive point, and the extension of Schedules B and C will tend to improve the system and will be accompanied by favorable financial results. It is doubtful whether the excise on rum, the all-important item in the schedule, has yet reached the maximum revenue rate; and, with the industry once adjusted to new conditions of production, a moderate increase would seem entirely practicable, should occasion therefor exist. Finally, the proportionate cost of enforcing the system will be reduced by conferring upon the insular treasury department the authority to punish minor or initial violations by quick administrative action instead of cumbrous judicial procedure. In all of these particulars, time, experience, and specific conditions will make clear where and when — without any departure from fundamental principles — omission, amendment, and addition are desirable. Until conspicuous unfitness therefor is displayed, full legislative capacity with respect to such matters should remain vested in the insular legislature. The sagacious provisions of the organic act, exempting

Porto Rico from the operation of the United States internal revenue laws, and permitting the adoption of an independent insular excise system, should remain a definite policy in future Congressional legislation.

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CAPITALIZATION OF THE UNITED STATES STEEL CORPORATION.

THE surplus earnings of the United States Steel Corporation for the first six months of its existence exceeded \$12,000,000. It is confidently asserted that the second half-yearly statement, to be issued in March, 1902, will be even more favorable. Thus far the enterprise is more than fulfilling the predictions of its promoters, that dividends could be maintained on both preferred and common stock. These large earnings are the result of productive advantages which have been so often enumerated and described that the briefest survey, by way of introduction to the present discussion, will suffice. The United States Steel Corporation controls 80 per cent. of the supply of iron ore at the head of Lake Superior. It owns practically the whole of that portion of the Connellsville coking coal field not yet exhausted. It owns the boats and railroads by means of which the crude materials of steel production are brought together. The plants of the Corporation are located at the points of largest present advantage, where materials can be most economically assembled and from which markets can be most easily reached. These plants include approximately 70 per cent. of the productive capacity of the United States, taking the total output of all forms of steel products as the basis of estimate. The policies of the company are directed by the most able men in the steel industry, and its financial support includes the strongest houses in the United States. The result of these advantages is production and distribution at a lower cost than has ever been reached by any company engaged in the manufacture of steel. Minimum expenses of production combine with heavy demands for product and

high-selling prices to produce the huge sum of profits which has been mentioned, and out of which such liberal dividends have been paid.

These profits, however, although enormous, are none too large for the requirements of investment security. Net earnings of \$125,000,000 give an annual surplus of \$40,000,000, or 2.8 per cent. on the total capitalization of the company. At this rate, in five years, providing that conditions of capital and income remained unchanged, a surplus of 14 per cent. will have been accumulated, and the common stock will be entitled to rank as an investment security. A more conservative management would refuse to pay dividends on the common stock until a considerable surplus had been accumulated; but the United States Steel Corporation was definitely committed from the start, not only by the announcement of its prospectus, but by the practice of most of its constituent companies, to a policy of liberal disbursement. And, having once been begun, this policy can be abandoned only at a sacrifice of security values which would entail heavy losses upon the stockholders and injure the reputation of the principals. The necessity for the payment of dividends arises, also, from the existence of the cumulative provisions which appear in the contract with the holder of the preferred stock. If the stock of the United States Steel Corporation were all of one issue, or if the cumulative feature did not attach to the preferred stock dividends, no dividends need be paid for the current year, and \$95,000,000 could be added to surplus reserve. Given another year as profitable as 1901 has been, and the Corporation would have accumulated a reserve fund of 20 per cent., and would then be able to guarantee a fixed return to its stockholders. The cumulative provision, however, enforces the necessity of the payment of 7 per cent. dividends on its preferred stock; and this payment requires a yearly appropriation out of earnings of \$35,649,924. Failing in the

payment of any part of this sum, the deficit remains as a preferred claim against earnings; and this must be satisfied before the resumption of dividends on the common stock. In justice to the holder of common stock, therefore, preferred dividends, when earned, must be paid out. Payment of dividends on one class of securities, moreover, is a presumption in favor of disbursements to the junior issues; and finally, as before remarked, the steel combine is definitely committed to a policy of dividend payment. In considering the financial position of the steel trust, therefore, we must understand by this term the ability of the steel trust to pay dividends.

We start from a basis of fixed charges of \$65,068,924, divided as follows: sinking funds and maintenance, \$14,119,000; interest on bonds, \$15,200,000; dividends on preferred stock, \$35,649,924. If the reputation and policy of the company demand the payment of dividends on the common stock as a condition of financial stability, the total requirements are increased to \$85,255,858, which must be earned before any surplus can be accumulated. Do the past history and present circumstances of the iron and steel trade, and, in particular, the situation of the United States Steel Corporation in reference to cost of production and market control, warrant the conclusion that this sum can be provided, and at the same time an adequate surplus reserve accumulated?

In the November number of the *Quarterly Journal of Economics*, under the title "The Integration of Industry in the United States," Dr. W. F. Willoughby presented conclusive evidence of the existence of a tendency in the industrial world towards the uniting of all the factors of production in particular lines into single companies, each of which owns or controls the source of its own supply of materials and markets its product in the finished form. Dr. Willoughby naturally found the best illustration of this tendency in the situation of the United States Steel

Corporation ; but he showed that the movement is already quite general, and is apparently destined to a much further extension. The advantages of this new system of production were shown to be considerable, the most important advantages being independence of fluctuations in the prices of materials and transportation, and the obtaining of all materials at or near the cost of production without deduction for intermediate profits. In the case of the United States Steel Corporation, moreover, it was pointed out that the greater part of its output was marketed in the form of products far removed from the unwrought steel billet, or bloom. In other words, the major portion of the earnings of the Corporation represent the combined profits of a long series of productive factors,— the mine, the coke plant, the railroad and steamship, the blast furnace, the Bessemer converter, the slabbing mill, and the plate mill,— all converging and uniting in the earnings from the sale of rails, tubes, tin plate, cotton ties, and structural material.

These gigantic profits and values, under the old-time system, before the steel industry became integrated, would have been divided among at least six classes of producers, each of which would have in turn contributed to the earnings of its predecessor, while it levied tribute upon the next in succession, and each one was at all times struggling to improve its position at the expense of its own buyers and sellers, with the result of considerable confusion of contracts and uncertainty of prices. The mine-owner could not calculate on a fixed rate of transportation ; the furnace man had no certainty, beyond the limits of a single season's requirements, that he would not be mulcted in the price of ore and coke ; the bridge manufacturer anxiously scanned the market prices of steel. Everywhere was ignorance, distrust, and friction. The most prominent characteristic of the interdependent system of production, as just pointed out, was the element of fluctuating costs.

Each producer in order, after a brief season of prosperity, would find his cost of production raised by the producer just before him. A high price of pig iron in the fall meant a high price of iron ore in the spring, and steel producers who had seen their customers make large profits on their purchases of low-priced billets and sheets hastened to equalize matters with these customers as soon as their commitments had been filled. As a result, no one member of the productive series was able to take full advantage of the opportunity for profits which a large consumptive demand always presents. The producer who stood nearest the consumer was perhaps in the most favorable position; but even here the manufacturer of hardware and the large buyer of materials, at the beginning of an advance of prices, eagerly contracted ahead, and the producer of tubes or wire was usually kept busy filling these low-priced contracts until the rising tide of preliminary cost destroyed his hopes of the larger profits to which high prices of his products would seem to entitle him.

At the same time that the costs of the steel industry were subject to such wide variations, the aggregate expenses of its different members suffered but slight changes in comparison. For example, the miner in the Connellsville region, during the depression in the coke trade from 1893 to 1898, received \$.928 for mining 100 bushels of coal. In 1900 he received \$1.25. The wages of the laborers around the ovens were changed to even less than the wages of the miner. The depreciation and sinking fund charges remained the same. The total cost of coke-making between 1897 and 1900 did not increase to exceed 25.0 per cent. per ton of coke produced, but the price of coke at the oven rose from \$1.23 in 1895 to \$2.70 in 1900, or 119.5 per cent.* The same can be said of the cost of ore and limestone, and also of pig iron and steel billets. The variation of the expenses of production

* From information supplied by Mr. H. P. Snyder, editor of the *Connellsville Courier*.

is always much smaller than the changes in market prices, because these latter represent the changes of general demand. Price is a social fact influenced by a number of outside circumstances constantly changing in their relation and in the degree of their respective influence. The expense of production, on the other hand, is a technical fact. It measures the resistance of nature to man's efforts and the slow and gradual fluctuations of wages. Expenses of production, therefore, as compared with market prices, fluctuate within narrow limits, although their general tendency is always towards a gradual decline.

It was from this situation of unstable costs that the "integrations" in steel production, of which the United States Steel Corporation is the foremost example, have delivered the trade; and in the freedom from the vexatious checks of advancing costs lies the explanation of the imposing profits upon which the huge capitalization of the company has been based, and to which that capitalization looks for its justification and warrant. The products of the steel trust to-day are produced at ultimate and fundamental cost,—a cost which contains hardly any element of profit from the beginning of the series to the end, and which represents only the bare expenses of producing and transporting the various materials,—ore, coke, iron, steel billet, steel plate, which antecede the final product.* These expenses of production, owing to the rapid progress of improvement in recent years at every stage of the process, are probably the lowest on record. The final products are sold at higher prices, higher than for ten years past, and in quantities which have never before been approached. The profits of the steel trust represent the total earnings at the time of its greatest prosperity of 70 per cent. of the iron industry of the United States, the combined profits of the numerous and widely sundered members of a complete productive process. These profits,

*No matter what system of accounting has been adopted between the constituent companies the final result would be as described.

if continued for five years, in spite of the heavy drain of dividend payment, will permit the accumulation of a reserve of surplus earnings sufficient in amount to guarantee the stability of both common and preferred stock.

The question at once arises, Will these profits continue? This question can be discussed from two standpoints. We can assume that the course of prices and earnings in the steel trade will follow in the future the direction of their past history, or we can accept the claim, so often made, that a new factor of potent influence has entered to steady the industrial situation and maintain the stability of industry; that the control of the supply possessed by the United States Steel Corporation will operate to steady the market, and will prevent prices from falling to the same extent as in past years. It is from the first point of view that the present discussion proceeds. The writer proposes to examine the situation of the United States Steel Corporation, on the hypothesis that a period of industrial depression, such as has invariably succeeded a period of industrial prosperity, will carry down to a low level the present prices and profits of the steel trade. An examination of the situation from the standpoint of past experience is certainly warranted, if only by the necessity of clearing the ground for the entrance of new factors, which, it is claimed, the industrial consolidations of the past four years have created.

The history of iron and steel prices is a record of fluctuations more frequent and extensive than those which have marked the course of any other class of commodities. The following table gives on four dates, covering a period of twenty years, the prices of the more important members of the group of iron and steel products:

HIGHEST AND LOWEST AVERAGE PRICES OF IRON AND STEEL, 1880-99					
	1880.	1885.	1890.	1894.	1899.
No. 1 foundry pig at Philadelphia,	\$28.50	\$18.00	\$18.40	\$12.66	\$19.36
Steel rails at mills in Pennsylvania	67.50	28.50	31.75	24.00	28.12

	1880.	1885.	1890.	1894.	1899
Steel billets at mills at Pittsburgh,		31.75	30.32	16.58	31.12
Wire nails of small size, Anderson, Indiana	10.40	5.91	4.60	3.81	3.28

Taking the fluctuations of pig iron as the subject of comment, we find that from 1880 to 1885 the price declined 36.9 per cent., and from 1890 to 1894 31.1 per cent., rising from 1894 to 1899 34.5 per cent. The fluctuations in the prices of the more advanced steel products were equally great. The demand for iron and steel represents perhaps more nearly than the demand for any other product the periodic fluctuations in business activity.

The course of production has tended to correspond with the range of prices. As a rule, however, although the production of iron and steel has immediately decreased in response to a fall of prices, the decline has been temporary; and within a short time, usually not exceeding a year, while prices still remain low, production has once more increased, although not at the same rate as before the decline in prices. The industries of the country having adjusted themselves to the lower level of prices, a renewed demand for iron and steel at low prices is met by an increasing supply, and normal conditions continue until the next explosion of industrial speculation sends prices up again. This sustained production of iron and steel on the new level of prices has been hitherto made possible by a readjustment of costs. The materials of every branch of the industry having fallen in price, expenses are correspondingly reduced, and a decrease in labor cost is facilitated by a decline in the cost of living. Decreasing cost of production enables the operation of works at a profit, although, without such a reduction in cost, the new price level would in most cases convert profits into losses, and cause a general suspension in the industries thus circumstanced. To put the matter concretely, unless the price

of pig iron declined along with the price of steel, the steel-maker would be compelled to operate his plant at a loss. In this decline in the prices of his materials the steel-maker found partial compensation both for the decrease in his profits, resulting from the former advance in costs, and for the present decline of his selling prices. Just as the members of the productive series, beginning with the mine and the transportation company, by advancing their charges had successively raised the expenses of production of the later stages of the process, so now, beginning with the manufacturer of finished materials and reversing the order, prices and costs successively declined. The wire mill paid less for rods, the rod mill for billets, the steel-maker for pig iron, until the weakness in demand from the final consumer had passed from one stage to the other back to the railroad, the boat, and the mine. The result of the interdependence of industry in a time of falling prices was, therefore, a compensating decline of the expenses of production, and a reduction of profits relatively much smaller than would have been the case, had costs of production remained comparatively stable from the beginning. While the aggregate profits of an interdependent industry over an extended period, compared with those of an integrated industry, are much smaller, they are, for the foregoing reasons, more evenly distributed, and exhibit in their movements a small margin of variation.

The significance of this principle of profit variation as applied to determine the security of the steel stocks is as follows: The United States Steel Corporation is an integrated industry. Its expenses of production contain but few elements of profit, and, compared with those of the régime which it superseded, are relatively stable. Its aggregate profits are, therefore, much larger; but, on the other hand, they are more unevenly distributed,—that is to say, the margin between the high and low points of the

profit curve is much greater than if the Corporation was obliged to purchase its supplies from other producers. In capitalizing the profits of such an integrated industry, the amount of stocks and bonds that can safely be issued should not absorb the maximum earning power of the new company, but should preferably represent the average of high and low profits, or, even more prudently, should be fixed at a point where the requirements of interest, maintenance, and dividends should not absorb more than the minimum earnings. If both of these rules are disregarded, and the maximum earnings of an integrated company are fully capitalized, especially if the capitalization contains a large proportion of interest-bearing obligations, its financial standing is certain to be impaired by the first decline of prices. A conservative policy is evidently far more necessary in the capitalization of an integrated than of a non-integrated company, because, in the case of a non-integrated business, the proportionate decline in profits, as a result of a fall in prices, is much less than where little compensation for falling prices is afforded by decreasing cost of materials. It is, therefore, impossible to escape the conclusion that the stocks of the United States Steel Corporation, because its capitalization is based upon the maximum profits of an integrated industry at a time when the margin between costs and prices was the widest, and also because that capitalization contains a considerable element of bonded debt, will be in danger of serious depreciation if prices should follow the course of past years.

It may be of interest to follow the working out of this principle of profit variation in a concrete case. The writer was recently privileged to examine a confidential report on the financial history of a prominent blast furnace company, which presented a detailed record of costs, selling prices, production, and earnings for a series of years. This company contracted for all its materials.

The management, equipment, economy, and efficiency of operation of this company have always been of the highest order. In fact, it is generally recognized as one of the best of the independent furnace companies in the State in which it is located. The main facts of its financial history are presented in the following table:—

<i>Year.</i>	<i>Price of Iron per Ton.</i>	<i>Cost of Materials.</i>	<i>Profit per Ton.</i>	<i>Annual Production, Tons.</i>	<i>Net Earnings.</i>
1890 . .	\$15.74	\$12.70	\$2.00	39,659	\$67,928.29
1891 . .	14.57	12.29	1.24	37,589	39,072.96
1892 . .	13.63	11.73	.86	30,755	18,244.77
1893 . .	12.31	10.27	1.00	50,957	25,787.98
1894 . .	10.58	8.82	.72	51,163	13,714.77
1895 . .	10.74	8.67	1.03	53,932	42,971.86
1896 . .	11.29	9.44	.71	37,107	20,815.94
1897 . .	10.40	8.55	.81	63,137	33,150.57
1898 . .	9.79	7.99	.76	64,816	32,319.51

The proposition which has been laid down regarding the tendency of the costs of non-integrated industry to vary with its profits is substantiated by this record. Compare, for example, the variation in the selling price of pig iron from 1890 to 1894 with the change in the tonnage cost of materials during the same period. A fall in price of \$5.16 is largely offset by a decline in cost of materials of \$3.88; and, as a result of this decline in materials, a profit is still earned. Had it not been for this fall in the price of ore and coke, the company would have sustained a heavy loss after 1893; for the selling price of pig iron from 1894 to 1898 was less than the cost of materials in 1890.

Let us now suppose that the proprietors of this company in 1890, the year of highest profits, corresponding to the year 1901, had decided to capitalize their enterprise on the same basis as that on which the capitalization of the United States Steel Corporation has been issued, namely: 5 per cent. bonds, 21.4 per cent. of the total; 7 per cent. cumulative preferred stock, 44.3 per cent.; and common

stock, 44.8 per cent. Let us further assume that, just as the steel trust has done, the new company decided to set aside 11.2 per cent. of its net earnings for sinking fund and maintenance charge, or \$7,607.96 out of net earnings of \$67,928.29, as well as a surplus reserve equal to 40 per cent. of net earnings, or \$27,171.32, before capitalizing any part of their income. The promoters of the iron company, pursuing the same policy of maintenance, sinking fund, and surplus reserve charges as that adopted by the promoters of the United States Steel Corporation, would have had remaining \$33,149.01 of the net earnings of 1890, upon which to base their issues of stocks and bonds. Indeed, this apportionment of earnings is even more conservative than that adopted by the syndicate managers of the steel trust; for it was not expected that the earnings of the consolidation would much exceed \$100,000,000. That is to say, putting the matter in another form, the proportion of surplus reserve which our supposed corporation in 1890 desired to set aside was at least 60 per cent. larger than the original intention of the organizers of the steel trust in this regard.

On this relatively conservative basis, and apportioning the available net earnings of the (——) Iron Company among the three classes of securities in the same proportions as the steel trust has apportioned its earnings, we have the following capitalization in 1890, corresponding to the capitalization of the United States Steel Corporation in 1901, and bearing the same relation to the net earnings of that company:—

<i>Class of Security.</i>	<i>Principal.</i>	<i>Interest or Dividends.</i>
7% cumulative preferred stock	\$237,725.60	\$16,640.79
4% common stock	276,160.00	9,846.00
5% bonds	133,258.98	6,662.44
	<u>\$647,144.58</u>	

We now have our company organized on the same basis, in relation to the surplus reservation out of its earnings

of 1890 and the capitalization of the different classes of securities, as the United States Steel Corporation in 1901. It will be instructive to follow the fortunes of our new company through the nine years succeeding its organization; and this is done in the following tables, which give (1) net earnings, (2) requirements for interest maintenance and dividends, and (3) surplus account from 1890 to 1898.

	I.	II.	III.	IV.	V.
YEAR.	Net earnings.	Fixed charges.	Fixed charges + 7 per cent. on preferred stock.	(III.) + 4 per cent. on common stock.	Surplus (+) or deficit (-).
1890	\$67,928.29	\$17,453.96	\$34,094.75	\$40,757.69	+27,170.60
1891	39,072.96	"	"	"	- 1,684.73
1892	18,244.77	"	"	"	-32,512.92
1893	25,787.98	"	"	"	-14,969.71
1894	13,714.77	"	"	"	-27,042.92
1895	42,971.86	"	"	"	+2,214.17
1896	20,815.94	"	"	"	-19,941.75
1897	33,150.57	"	"	"	-17,607.12
1898	32,319.51	"	"	"	-18,438.18

We have here represented the financial history of a company capitalized on the same basis as the United States Steel Corporation during a period of low prices. Let us go over the results appearing in column "V.," applying them to the position of the different securities, and assuming that the Corporation is managed with an eye to security. In 1890, after meeting all fixed charges and paying dividends on both preferred and common stock, a handsome surplus would have remained on the year's operations. In 1891 the surplus of the preceding year would have been trenched upon to the extent of \$1,684.73 to keep up the common stock dividend. In 1892, no dividends could safely be paid on either class of stocks, because, after meeting fixed charges, only \$790.81 remained out of the net earnings of the year. This would

be added to the surplus reserve, bringing that item up to \$27,286.68. In 1892, since the preferred stocks are cumulative, a back dividend of 7 per cent. is accumulated, which must be paid before dividends are resumed on the common stock. In 1893, to continue our examination, \$8,334.02, or $3\frac{1}{2}$ per cent., was earned on the preferred stock. In view of the fact that the surplus reserve of the company, which now stands, as above noted, at \$27,286.68, is only 4.4 per cent. of the total capitalization, a prudent management, such, for example, as the present governing body of the United States Steel Corporation, would undoubtedly refuse to pay out this excess of net earnings over fixed charges, and would carry the balance to surplus, bringing that account up to \$35,620.70. The consequence of this decision would have been to add another 7 per cent. to the accumulation of unpaid preferred dividends already standing against the common stock. In 1894, came the period of low prices, which would have justified the conservative decision of the preceding year. Net earnings would have fallen below fixed charges, and \$3,745.19 would have been drawn from the reserve to pay interest, bringing down the reserve to \$31,875.51. Another passed dividend on the preferred would have accumulated 21 per cent. against the common stock. The result of the operations of the next four years would have been a surplus of \$59,442.04 over the total fixed charges for this period. Out of this sum, $3\frac{1}{2}$ per cent. could have been safely paid on the preferred stock, and the balance, \$26,160.46, carried to surplus reserve, increasing that account to \$58,035.97, which is 4 per cent. on the capitalization of the company,—a very respectable showing, although still considerably less than the highest standard of investment security would have required. By 1898, however, the accumulation of back dividends against the common stock would have amounted to 35 per cent. on the preferred stock; and the junior se-

curity, therefore, would have only a nominal value, not merely in view of the existence of the back claim accumulating for eight years past upon future earnings, but because of the fact that no dividends had been paid for an extended period upon the common stock. The value of the preferred stock would have probably settled itself around 40, and the bonds alone would rank as an investment security. The conclusion is plain that the basis of capitalization of the United States Steel Corporation, if the experience of the (——) Iron Company is any criterion, and if prices follow the course of past years, is dangerously insecure, and that both classes of stocks are at all times highly speculative in character.

The financial analogy which has been drawn, however,* is by no means complete. The profits upon which it is based are those of a non-integrated company that found a large measure of compensation for the decline in the price of its product in the reduced value of its materials. The high and low points of the profit curve of the (——) Iron Company are, therefore, much less widely separated than would have been the case, had the company produced its own materials instead of purchasing these from other producers. In order to make an exact parallel with the present situation of the United States Steel Corporation, it is necessary to reestimate the earnings of the company under examination on the basis of a cost price for materials. In making this estimate, the average cost of materials to the company from 1894 to 1898 is taken as an approximation of the total expenses of producing these

* The writer has not been able to obtain a statement of the earnings of the (——) Iron Company from 1898 to 1901. He has been informed that full advantage was taken of the recent rise of prices, and that the large earnings of 1890 were considerably exceeded in these later years. The inference is that, even on the assumed basis of capitalization, the back dividends could have been paid off out of the profits of two years' operations, and that during the past two years the company could have paid a good dividend on its common stock. This favorable result, however, does not in any way authorize the scale of capitalization which has been mentioned.

materials from 1890 to 1893. This estimate is probably somewhat under the facts, but, as will presently appear, is all the more warranted for that reason. Taking materials at producers' cost, just as the United States Steel Corporation receives them, the profits of the (——) Iron Company in 1890 would have been \$228,039.25 instead of \$67,928.29, the amount actually realized; and the capitalization of the company, arranging it as before on the basis of the same allowance of surplus and maintenance charges, and with the same apportionment of earnings to the different classes of securities as the method employed in the capitalization of the United States Steel Corporation, is as follows:—

INCOME.

Total net earnings	\$228,039.25
Reserved for surplus	72,960.00
Reserved for sinking fund and maintenance	28,280.00
Available for fixed charges and dividends	126,760.70

CAPITAL AND CAPITAL REQUIREMENTS.

	<i>Principal.</i>	<i>Interest and Dividend Requirements.</i>
5% bonds	\$527,136.00	\$26,356.80
7% cumulative preferred stock	908,091.00	63,566.40
4% common stock	920,937.60	36,837.50
Totals	\$2,356,164.60	\$126,760.70

Here is a capitalization, based upon the earnings of an integrated industry for 1890, and apparently warranted by those earnings, nearly four times as great as the capitalization which could be based upon the earnings of a non-integrated industry after allowing the same proportion of reserve. The enormous preponderance in earnings of the modern system of production represented by the steel trust, compared with the old-fashioned method, is at once apparent. But the danger of a full capitalization of these larger earnings is equally evident. For now we are to

have but little compensation for declining prices in declining costs. Let us admit a decline in producers' cost from 1890 to 1894 of 20 per cent., which is certainly well above the reduction that actually took place, and see how our company stands the strain. The statement of earnings, fixed charges, dividend requirements, and surplus account,—taking materials at producers' cost,—would have been as follows:—

Year.	Net Earnings.	Fixed Charges.	Fixed Charges + 7% on Pre- ferred Stock.	(III). 4% On Common Stock.	Surplus (+) or Deficit (—).
1890	\$228,039.25	\$59,636.80	\$118,203.20	\$155,040.00	+\$72,960.06
1894	21,488.46	59,636.80	118,203.20	155,040.00	—133,551.54

In sharp contrast with a surplus over all requirements of \$72,960 in 1890 appears a deficit of \$38,148.34 below fixed charges in 1894; and from this time on fixed charges would have more than absorbed all available revenue, leaving nothing for surplus and for the preferred stock, and considerably less than nothing for the common stock, which would have been buried under a mountain of preferred accumulations. In other words, before the period under examination had been half concluded, the property of our company would have been in the hands of the bondholders. Such would have been the inevitable result of putting the (—) Iron Company in control of the sources of its supplies of material in 1890, and of capitalizing the larger earnings thence resulting on the same basis as that on which the present capitalization of the United States Steel Corporation is based.

The lesson of this analogy and its application to the situation of the United States Steel Corporation is by no means obscure. It has already been plainly stated, but will bear repetition. The steel trust has capitalized to the full limit of present safety the largest earnings in the history of the steel trade. The surplus which will remain out of the earnings of the current year is no more than sufficient to meet the requirements of investment security.

If these earnings continue for five years, as has been pointed out, a reserve of approximately 15 per cent. will have been accumulated, and the Corporation can begin to plume itself on its investment standing. If prices and earnings in the steel trade, however, follow the same course as in past years, those earnings will suffer a decline more astonishing than their advance has been phenomenal. The proposition cannot be too often emphasized that integrated industry means more stable cost of production, and therefore, unless an equal stability can be imparted to the prices of sale and the volume of output, a wider zone of profit variation. With integrated industry, costs do not rise with prices; and profits, therefore, increase with greater rapidity than when other profits are deducted from them. But, on the other hand, when the turn comes and the tide of prosperity ebbs, since the expenses of production have not risen with the advance, neither do they decline with the depression; and prices fall with slight compensation from decreasing costs. The capitalization of the steel trust represents the top of the wave of prosperity. It is not difficult to forecast the value of that capitalization when the wave recedes.

It is not the writer's purpose to venture upon a prediction of disaster to the Steel Corporation. If steel prices and the earnings of the steel trade decline, as they always have declined in the past, there cannot be the slightest question that the value of both issues of its capital stock will be destroyed, with every probability that title to its properties will pass to the holders of its mortgage bonds. This is the teaching of experience. Steel has always been, in the picturesque phrase of Mr. Carnegie, either a "king or a pauper." And poverty in the steel trade means the extinction of the steel trust. It is, however, legitimate to urge that industrial conditions, as a result of the inevitable consolidations of recent years, are now so stable that the earnings of the Steel Corporation can be maintained

on a high level. This opinion has the sanction of high scientific authority, and it is not to be lightly gainsaid. It will be fortunate for the holders of the steel stocks if the result shall justify these optimistic predictions.

As this paper goes to press, the second report of the Steel Corporation shows estimated net earnings for the first year of \$100,000,000, a considerable reduction from the original estimate of \$125,000,000 adopted as the basis of the preceding computations. The result of a re-computation would evidently be much less favorable to the Corporation than the one which is allowed to stand.

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A POSITIVE THEORY OF ECONOMICS.

BELIEVING.—I hope not too hastily—that the “Risk Theory of Profit” is sufficiently well established to justify its being subjected to the final and crucial test of being fitted into the general scheme of Economics, to see whether the modifications it necessitates are in line with the natural evolution of economic dogma, and whether it sensibly aids in the formulation and resolution of industrial problems, I venture to tender the following observations.

The recognition of enterprise as both a fundamental and the directive factor of production appears to afford a basis for an accurate demarcation of the exact field covered by Economics. It renders possible what has hitherto been lacking,—an indisputable definition of the science itself. This, indeed, would naturally follow any accurate determination of the nature of profit and of its productive factor. So long as a problem of four forces was studied and formulated as a problem of three forces, or as a problem of three known and understood forces and one partially known and misapprehended force, the extent of the field of investigation could manifestly never be sharply distinguished. Under such circumstances, even if a correct definition of the science happened to be proposed, its correctness could neither be proven nor appreciated, unless it also involved a proper appreciation of the missing or misunderstood force, especially as this latter force happens in this instance to be the controlling one.

The object of all conscious human actions is the enjoyment of happiness and the avoidance of pain, or, in other words, “well-being,” or “weal.” The fundamental distinction between human activities is evidently between the altruistic and the egoistic, the latter division being, of

course, the one in which economic activities are included. The problem of defining Economics is, therefore, only resolvable by differentiating economic activities from other egoistic activities. Now there are only three methods of classifying egoistic activities possibly applicable to our purpose, namely: first, by the character of the ends to be attained; second, by the means adaptable to the attainment of ends; or, third, by the methods adopted for the attainment of ends,—as in these three differentiations all possible variations of motive are involved. We can say that some egoistic activities are directed to the attainment of physical benefits, others to intellectual progress, others to moral development, etc.; but a moment's consideration will make it evident that the character of the result of human actions is not the principle upon which we can found our classification, because in many instances results of the same character can be obtained by either individual, social, or economic endeavor. We have no better success when we turn to the second possible principle of classification; namely, that of the means (in the narrow sense of the term exclusive of methods) adaptable to the acquisition of "weal." We can, and do, use our intellectual powers, our physical powers, and the powers of nature, mechanically adapted, for the enhancement of our well-being; but economic activities refuse to group themselves under any one of these headings, as all these forces are alike exercised in individual, social, and economic activities. Since the distinguishing peculiarity we are in search of is to be found neither in the character of the result obtained nor in the means employed to bring about the result, it must depend upon a difference in method. If, then, we can discover the radical difference between the methods employed in individualistic, social, and economic activities, we are forced to define each of the three kinds of activities in terms of its peculiar method.

When we approach the problem of defining Economics

from the standpoint here indicated, we cannot fail very shortly to appreciate that there can be no more radical or fundamental difference in method between Individual, Social, and Economic egoistic activities than this: the first class of actions are those of the individual acting by himself alone without any combination with others, and for himself alone. When an individual by his own unaided efforts creates a product not for his own consumption, but to be exchanged, his activity is, of course, combined with that of the person with whom he exchanges. The second class of actions are those in which two or more individuals combine to produce a result or product, the share of which that will accrue to each individual concerned is indefinite and indeterminate,—indeed, often so indefinite and indeterminate that a considerable, and sometimes even the greater, part of the resulting benefit will be enjoyed by those who had nothing to do with bringing it about. Or, in other words, a social egoistic activity is one in which actions are combined for a mutual, social, or common purpose, in the benefit of which each participant in the activity expects only an indefinite share, almost or entirely unrelated to his personal contribution to production. The third class of actions—namely, the economic—are combined actions entered into by each participant because he expects a share of the resulting benefit bearing a definite relation to his contribution to its creation.

It will probably be objected by some that there are other activities usually considered to be economic that this third group does not include. In the course of this article I will endeavor to show why some, and by inference all, of these omitted activities are not really economic. The point here to be insisted on is this: that, if the activities in dispute are really economic, it can only be because there exists a more radical and fundamental principle of division among egoistic activities than the one I have

utilized. Manifestly, this is impossible, as the only more fundamental difference in incentive is when the benefit sought is for others, and that marks the distinction between altruistic and egoistic actions.

Now how can actions be combined for definite personal purposes,—that is, for a prearranged division of the benefit of the result definitely dependent upon contribution? At first sight it would appear that there are two possible methods of doing this. The first is that of communism, in which the product is either equally divided among the individuals contributing to production or divided in arbitrarily prearranged percentages. The second is the competitive, or usual, method in which one of the contributors hires the others by giving each a definite and predetermined personal reward based upon his usefulness, and assumes the whole of the resulting benefit or the ownership of the product.

Although the motive to human activity is always personal, what we are classifying is not a group of individuals, but a group of human activities exercised by two or more individuals, segregating those that are combined for definite personal ends. If we examine into the nature of these activities, it appears that, if the risk theory of profit is correct, not only economic but individualistic and social activities are divisible into four fundamentally distinct kinds, two of which, those of land and capital, are uses, and two of which, those of labor and enterprise, involve personal sacrifice,—in the one case the pain cost of labor, and in the other the irksomeness of risk and responsibility. Now in a communistic group each individual is landlord, capitalist, laborer, and enterpriser in exactly the same proportion. His individual share of the "weal" produced by the united efforts of the community is not only practically indivisible into rent, interest, wages, and profit (thus destroying the opportunity for the interplay of the economic factors), but it depends only to

an infinitesimal degree upon his own contribution. If he labors honestly and his efforts prove effective, it is not because he has been actuated in any considerable degree by his own personal ends, but because he has been moved by altruistic or social motives or because he has been coerced into activity. The motives for the creation of "weal" effective within such a group as the Oneida Community, as at first instituted, are not those which lead men to combine their actions for definite personal ends; and they must therefore be excluded from the group of human activities that our classification declares are economic. Such combinations are distinctly social, because there is lacking a definite personal relation between the incentive to and the reward of exertion. It is only when the Oneida Community entered into competitive dealings with the outside world that economic considerations became effective; and the Science of Economics must therefore regard the community as constituting a single economic individual. And, if it should ever come to pass that the whole world was organized into a single communistic group, combined human activity for definite personal ends, and therefore economic activity, would be an impossibility.

The case of a co-operating group is different from that of a communistic group in that the individuals composing it do not contribute the use of land, the use of capital, and their labor in the same proportions. Such a group only differs from an ordinary group of competitive individuals combined for economic "weal" production in that the function of the *entrepreneur* is performed by the group as a whole, and not by a selected part of the group. The risk of ownership and the responsibility and direction of the enterprise rest upon all jointly, to be sure, but in definite proportions. And, as the individual members share the results of the risk and responsibility in the same proportion as they contribute otherwise to the creation of the product, there is the definite personal relation between

enterprise and its result required by our definition. There exist, therefore, the same personal incentives to the utilization of land and capital, to the exertion of personal energies, and to caution and care in the selection of risks and the assumption of responsibilities that actuate the members of a group composed of competitive individuals acting under the direction of a single *entrepreneur*. The internal as well as the external relations of a co-operative group are wholly economic, and not social, unless of course, as is apt to be the case in such associations, a certain proportion of the undetermined residue, or of the gross product, is not divided directly among the members of the group, but is devoted to social purposes.

The combination of egoistic human activities for definite personal ends involves, therefore, a certain method of combination as the only one possible for such activities; namely, that some individual, or group of individuals, theoretically and practically distinguishable, must assume the responsibility of the enterprise, and the direction of the undertaking inseparable from the responsibility, and that by so doing the risk-takers necessarily acquire the exclusive ownership of the product, and reward those who contribute the use of land, the use of capital, and personal exertion, not with any share of the product itself, but with stipulated amounts of purchasing power, bearing, however, a definite relation in each case to each participant's contribution to the result.

It is only when we view the matter abstractly that landlords, capitalists, and laborers can be said to share in the product. The creation of the product involves the creation of an equivalent amount of purchasing power; and it is this newly created purchasing power, and not the product itself, which is divided among the productive factors. A distinguishing mark of an economic action is that its governing purpose is not the creation of utility, but the

creation of command over utilities, or purchasing power. And the point to be here observed is that purchasing power, being an inseparable attendant upon ownership, cannot be evolved in any other way than through the utilization of land, capital, or labor, or of two or more of them combined, by enterprise. Or, in other words, the "indirect method of production"—that is, the satisfaction of wants through exchange—is necessarily coincident with the combination of human activities for definite personal ends. Each expression exactly connotes the other.*

Instead of founding the primary classification of egoistic activities upon the distinction between individual and combined action, we can found it upon direct and indirect methods, the direct method being, of course, that in which the special thing desired is produced either immediately or ultimately by the aid of tools, the indirect method being that whereby the desired object is obtained by making something not desired for itself, but capable of being exchanged for the desired object. This classification results, however, in exactly the same arrangement as that founded upon combination, the only difference being that

* It may be objected here that the combination between buyer and seller differs in character from the combination between the enterpriser and his employees, but a careful analysis will make it plain that it does not differ in the essential point which serves as the basis of our definition of economic activities. The individual producing anything by his unaided efforts manifestly performs, at least, two creative functions, whether he intends the product for his own consumption or for exchange,—the functions, namely, of labor and enterprise; and in both instances the personal purpose, though quite different in character, is equally definite. What makes the former purpose individualistic and the latter economic is that the personal purpose in the latter case alone leads to a combination of persons. Moreover, there is a similar differentiation of profit and enterprise. The isolated producer of an exchangeable product being a single individual, the profit cannot accrue to a person or group of persons distant from the other joint producers. But what amounts to the same thing in this connection the single producer for exchange is forced to consider the results of his two functions separately. That is, he always compares the probable results of his unaided efforts with what he could obtain for his labor by hiring himself to another. Manifestly, there is no theoretic difference that need concern us here between the employer employing himself alone and the one employing himself and others.

in the latter case individual actions form a class by themselves, while social and economic actions are sub-groups of the complementary class of combined actions: whereas, in the former case, economic actions form a class by themselves of indirect activities, while individual and social actions are sub-groups of the complementary class of direct actions. Which method is logically preferable does not affect our argument, for both classifications involve the same arrangement; and the definition of Economics here given recognizes both, the idea of indirectness being involved in the term "purchasing power."

We have now arrived by analysis, and through the application of the principles of classification, at the following positive definition of the Science of Economics, which cannot, therefore, be successfully assailed except by the detection of some error in the application of the process by which it has been obtained:—

"Economics is the study of the interrelations of that group of egoistic human activities which are called into combined action by the expectation of a definite personal share of the purchasing power resulting from their joint activity; and of their outer relations or how these activities and their results are affected by the physical, ethical, and social environment, and by changes in the environment."

As the purchasing power obtained in a given time by any individual is what is meant when his income is spoken of, perhaps the best terse definition of the science is that "Economics is the science of Industrial Income."

To guard against possible misunderstanding, I would say that by definite I mean only prearranged, and do not mean predetermined in amount. The shares of three productive factors are indeed so predetermined: that of the *entrepreneur* is not, but it is none the less prearranged and defined, in that he is to get whatever is left over after the predetermined claims of the others are satisfied.

The word "industrial" I put before income, to exclude the incomes of the thief, gambler, and speculator, the purchasing power obtained by these classes not being a new creation of purchasing power arising from combined activities, but only an appropriation of purchasing power previously created, differing from the income of the monopolist in that the latter is an appropriation of an undue (in the sense of "greater than would accrue under free competition") but still definite and prearranged share of a newly created purchasing power, to the creation of which the monopolist has contributed.

This definition of Economics was hardly possible so long as the true function of the enterpriser and its relation to the three subsidiary productive forces was unrecognized. Of course, the position of the *entrepreneur* as the director and governing force of industry has not been wholly ignored by economists, but they hardly seem to have attached much importance to it; and, if the Risk Theory of Profit is correct, they have hitherto failed to understand clearly in what his peculiar function consisted. Under such circumstances the method by which the above definition of Economics is obtained — namely, through the application of the principles of classification — would have necessarily proved inefficient, even if the attempt to utilize it had been made. . . . Manifestly, the distinction between economic and social combination could only be dimly appreciated so long as an all-important special peculiarity of the former — namely, the differentiation of enterprise — was ignored.

President Walker once remarked to the writer that "there was only one permissible use of an economic term, and that was the right one"; but he was unable to explain how the right use could be ascertained. His remark put me in search of some such principle, until, finally, I satisfied myself that this test can be afforded by a

rigid adherence to the principles of classification whenever we are able to start with a clearly defined general class,—such a group, for instance, as human activities. That economists have not more frequently availed themselves of these and other principles of classification not mentioned here is due, of course, to the fact that, so long as no indisputable definition of the science had been formulated, they were necessarily without any such clearly defined general class to the subdivision of which these principles could be applied.

The first requisite of valid classification, though it is one seldom recognized, is a clear demarcation of the group to be arranged in classes. For the purpose in hand this group is evidently that of the egoistic human activities. Indisputable though this appears when stated, several circumstances have stood in the way of its being clearly apprehended. In the first place, so far at least as I am aware, no one has anticipated me in claiming that the only method of arriving at precise definitions of scientific terms, demonstrably correct, and therefore positive, is through the utilization of this and the other principles of classification. Indeed, I have not been able to find any treatise specially devoted to these principles, as applicable to the moral sciences, though very likely such treatises exist.

Of course, all definition involves classification; and to make a distinction is really nothing but the division of one sub-group from other sub-groups. In this sense, economists have freely availed themselves of classification. What I mean is that, while any given group can be subdivided in many ways, there are principles governing the selection of the special way alone applicable to the question in hand, and that these principles of selection have not been adequately recognized by economists as imperatively governing the use of scientific terms, though they have not, of course, been entirely oblivious of them. Sec-

only, economists have fallen into the habit of speaking of land, capital, and labor (in the sense of labor force), as the productive factors, fundamental to the science: whereas these are not human activities, or, indeed, activities of any sort. It is the use of land, the use of capital, and the employment of labor that are the real productive forces. This use of terms could hardly have misled if enterprise had been recognized as a productive factor. Land, capital, and physical power are concrete material things: whereas it is not any material thing, but the human mind, which is enterprising.

The second requisite for valid classification is that each sub-group should be demarcated from the others, not by means of general differences and resemblances between individuals, but by the one point of difference or resemblance that is the most germane and radical to be found, and is, therefore, the fundamental one. Cuvier applied this principle to biology when he subdivided the animal kingdom into groups demarcated from each other by peculiarities of their bony framework and internal organs. Why are differences founded on these peculiarities fundamental to biology? Simply because observation has shown us that they vary less rapidly than other peculiarities of animals, and therefore mark the evolution of species, and contain the history of the development of life from its simplest to its most complex forms, which is the most important problem of biology. In South America a species of moth so closely resembles a species of butterfly as to be almost indistinguishable from it, and the two would be classed together by any one following the method of classifying from general differences and resemblances. Such a classification is possibly justifiable for certain subsidiary purposes, just as it would be to classify animals by their color,—all white animals together and all red ones together, though it would be absurd to make this the fundamental distinction in biology. But the difference in

absurdity is only one of degree when the distinction used to divide any one group from another is not the single one most germane and fundamental to the subject under investigation.

Now I fear economists are frequently open to the charge of disregarding this essential principle. For instance, some of our ablest economists identify land with capital because the value of land can be capitalized, or because more capital has been expended upon land in drainage, fences, and other improvements that affect its productive power than the present value of the land amounts to. But does not the distinction between land and capital, which is really fundamental to the science, arise from the nature of the incomes derived from them rather than from how land and capital originated? This is necessarily so because the character of the motives leading to the utilization of land and capital and to their appropriation or accumulation varies with the nature of the income expected. The real distinction between land rents and the monopolistic accretions to other forms of income which economists are fond of speaking of as rents is this: that the latter are accretions to other forms of income due to special opportunities, and are more or less subjected by this circumstance to the tendencies affecting interest, wages, or profits, while the income from land is not an accretion, but wholly due to special advantages, and consequently is not directly affected by such tendencies. If the income from capital invested in draining a farm is thereafter governed by the laws and tendencies affecting other rentals and ceases to be under the influences affecting interest, is it not more scientific to regard the capital as converted into land and thus preserve the distinction between land and capital? Likewise with capital expended for an education. Has it not become labor force? It must be so regarded if we are to consider the wages of the skilled laborer as still wages, and not

partly interest. Slavery furnishes an instance of the transmutation of labor force into capital.

Many similar instances of the disregard of this principle of classification could be cited. What especially interests us here is to inquire how it happens that it has been so disregarded. It seems due to the fact that no proper recognition of the really fundamental distinctions was possible until the position and function of the enterpriser was accurately comprehended. All variations in human actions are due to variations in motives. Therefore, the most fundamental fact of human actions is the motive which prompts them. And the motive which is essential to all individual action, and to all combined action, both social and economic, is profit; that is, the expectation of acquiring an unpredetermined residue. What led to the first exchange of fish for game? The fisher had an approximate idea how much game he could secure by hunting, and the hunter how many fish he could get by fishing. Each, evidently, produced more of his own commodity than he had any use for, because he hoped he could get more of the other's commodity by exchanging with him than he could produce himself. How much more he could not tell. That would depend upon his finding a purchaser and upon the bargain he made. The difference between what he could obtain directly, and what indirectly through exchange, was an unpredetermined residue, the absolutely essential condition to acquiring which was that he should assume the risks attendant upon ownership.

The same is true of more complex combinations. They will not be formed under any other incentive than that of the expectation of an unpredetermined residue, the difference between social and economic combinations being simply that in the one case the unpredetermined residue accrues to the group as a whole, and in the other to that one, or more, of each group who assumes the responsibil-

ity of the undertaking. The use of land, the use of capital, and the exertion of labor can only be combined under the incentive of enterprise. They are passive or static. Enterprise is the only active and dynamic force, and, strictly speaking, the only productive force, the others being merely agents or tools. Naturally, before it was perceived that a fundamentally distinct form of income arose from responsibility, and the assumption of the risks attendant upon ownership was ignored as an economic factor, it was impossible to properly apply the second requisite of valid classification to economic problems.

The individual, in selecting one course of action in preference to another, is determined in his choice by the excess of expected benefit, which excess is always an undetermined and uncertain residue, and, therefore, of the nature of profit. Society is likewise determined by the difference between the cost of, and the benefit expected from, a proposed social result; and this difference is also an undetermined and uncertain residue. But in individual activity the risk or uncertainty incurred is always attendant upon, and inseparable from, all the other activities exercised by the individual. And in social activity the risk, or uncertainty, is assumed by the group as a whole; and the share of the undetermined residue which will finally fall to any given member of the group is indefinite. Whereas, in economic activity, the undetermined residue, without which as an inducement activities cannot be combined for the creation of "weal," accrues wholly to one class of producers. The vital distinction, therefore, between economic and other activities is that in the former alone the exercise of the function of enterprise is differentiated from the exercise of the other "weal" productive functions, and thus becomes the controlling factor. From which it necessarily follows that the fundamental economic distinctions between the three subsidiary factors of production must refer to their rela-

tion to enterprise, and not to their origin. In other words, that is land for the use of which the enterpriser pays or foregoes rent, that capital for the use of which the enterpriser pays or foregoes interest, and that labor for the exercise of which the enterpriser pays or foregoes wages.

Manifestly, therefore, ignoring the existence and peculiar characteristics of enterprise as a distinct productive factor involved not only the ignoring of the fundamental distinction between economic and other forms of "weal" productive activities, but involved also the failure to fully understand and differentiate the three subsidiary productive factors.

Another very important difference between economic and other activities arises from the function of enterprise being differentiated in the former. In individual and social activity the main — indeed, the only — object is to obtain as great a difference as possible between pain cost and the "weal" created: whereas economic activity, being controlled and directed by the enterpriser, will be regulated by differences between *entrepreneur* cost and selling price; and although there is a tendency, due to the competition of *entrepreneurs* among themselves, for *entrepreneur* cost to conform to pain cost, it is manifest that the greatest good obtainable by *entrepreneurs* will never be exactly coincident with "the greatest good of the greatest number" theoretically obtainable from a given gross product. Any loss to the subsidiary factors on this score is, however, more than made up to them from the increase of product necessarily resulting from the better organization of the productive forces under the lead of enterprise.

The third requisite of valid scientific classification is that the various sub-classes into which any given group is divided shall each be distinguished by a peculiarity of the same kind. If I may be allowed to illustrate by the controversy over the Risk Theory of Profit, it should not

have required demonstration, if this principle of classification is correct, that the reward for the assumption of risk, when the assumption of risk is once recognized as a separate industrial function, could not accrue to any of the other productive factors, so long as they were distinguished from each other by the character of their functions. So long, that is, as rent, interest, and wages act as the incentive to the use of land, the use of capital, and the exertion of labor, it should have been axiomatic that the reward of risk, inclusive of risk-taker's rent, must serve as the incentive to some industrial factor other than land, capital, and labor, and could not accrue to the co-ordinator, who is only a laborer, or to the capitalist.

A fourth principle of classification is that the subdivisions of a genera shall not overlap, or, in other words, that no individual shall belong equally to two or more of the subdivisions. It is not meant by this that we should always be able to determine positively the sub-group to which any given individual should be assigned. Our knowledge of the individual may be insufficient especially in a classification of actions in accordance with the motives which cause them, as cases constantly arise in which the motive is a complex one. Nor is it intended that compound individuals may not be assigned to two or more groups according to the point of view from which they are regarded. Thus the activity of judges, soldiers, and policemen, is social, so far as society's action in hiring them is concerned. Society's motive in employing them is the common good; and the actual product of their labors is an element of social, not of economic "weal." On the other hand, the actions of this class, viewed from the standpoint of their own motives, is economic. Their incentive is the salary, wages, or fees society pays them; and their labor is productive to themselves of an income of wages, composed of purchasing power, which is an economic quantity. We have, in this case of combined

human activity, only an instance where one party to the combination is actuated by social and the other by economic motives; and the activity itself is social or economic, according to the standpoint from which we regard it. But there is no "overlapping of sub-groups," nor any necessary confusion of thought, because, when the point of view is once selected, there is absolutely no doubt as to the class to which the activity in question belongs.

A fifth principle of classification is that the distinguishing peculiarity utilized should be dynamic, and not merely incidental. Thus the definition of Economics as the Science of Exchange, when the exchange between persons is intended by the term, gives practically the same scope as the definition here advocated, because, as has been shown elsewhere, exchange is not only a necessary part of the only process by means of which activities can be combined for personal purposes, but is incidental to no other process. But the definition of Economics as the Science of Exchange was rightly abandoned and neglected, because it teaches us nothing of causes. Exchange is a means, not an end or purpose; and the explanation of volitional activities must be sought in the motives which cause them, and not in the mere means adopted to accomplish purposes.

Here it may be well to anticipate a possible objection to the distinction I have made between individual and economic actions, in that many actions that are certainly uncombined and individualistic are governed by economic considerations, and must therefore be regarded as economic. Thus a man's electing to shave himself may be wholly due to motives of economy. Again, when a man ceases to rent his house, either buying the house he was living in or building another, there would seem to be no valid reason why the shelter enjoyed, when afforded by his own house, should cease to be regarded as an economic quantity,—converted, that is, from an element of "eco-

conomic weal" into an element of "individualistic weal." The reply to the objection involved in the first instance is that actions to become economic must be not merely affected by economic considerations, but controlled by them. In the many instances in which a given benefit may be secured either by industrial, social, or economic effort, or by either one of two of these methods, the choice of the individual will be determined by a comparison of the pain cost of the different methods open to him; and to that extent considerations of the one method may be said to affect the others. Thus any one who finds it easier to shave himself than to earn fifteen cents will keep away from the barber shop. But his shaving himself is not an economic act, although it is done from motives of economy. In the latter and broad sense of the term, the word denotes simply a saving of effort, or of pain cost, which is the controlling motive of every conceivable human action. If the Science of Economics is to retain the word in the broad sense, it can do so only by becoming the science of all human activity; and it must lead to our refusing to distinguish economic motives and actions from individualistic and social motives and actions. In which case we should simply be forced to invent another name for what are now considered economic motives and actions, which we would be obliged to distinguish from "individualistic economic" and "social economic" motives and actions by the differentiating principle I have employed to separate economic from other activities. There certainly seems to be no intermediate sense in which the term can be used.

The case of the house-owner is especially instructive in this connection. The shelter afforded by his dwelling remains an economic quantity, and a part of his income of purchasing power, to just the same extent as his investment in the house remains an economic quantity, and no more. The usual sequence to buying a house is improving it. So long as additions to the investment increase the

renting power and selling price of the house, they remain economic quantities. But, when they are made to gratify special whims of the owner or to supply conveniences others are not likely to care for and will not pay for, they cease to be economic quantities. Thus, when a rich man pays the market price, say \$25,000, for a country place, he could rent it so as to receive the usual return on such an investment, or get his money back by reselling. His choosing to consume the service himself does not lessen the economic character of the rental, which should be considered part of his income. But, if he expends an additional \$25,000 in improvements of such a character that he can neither rent the place nor sell it for more than was obtainable before, this additional expenditure has ceased to be an economic quantity. Nevertheless, as long as he enjoys the use of the place, it is twice as "weal"-productive as before, though only half the service rendered is an economic quantity, the other half being an element of individualistic weal, and not a part of his income in the economic sense of that term. Now what makes the distinction between the two halves of the "weal" created? It is the retention of purchasing power. And purchasing power connotes combined action. In other words, the house and the service it renders remain economic quantities to exactly the extent in which combined activity for definite personal ends remains possible.

When the Social Organism — that is, the State — enters the market to buy or sell, the intrusion of purchasing power marks also the intrusion of economic motive and economic activity. We have already seen that the individual, when he sells something entirely produced by his unaided individual efforts, thereby satisfies his own wants by combining his activity with that of the purchaser of his product, and also that a group of individuals like the Oneida Community, whose internal relations are social and non-economic, becomes economic in its dealings with the outside

world. So, when the larger and all-inclusive group known as "the State" enters the market as a competitor either in buying or selling, even when its competitors are its own citizens, it becomes an economic individual or person, and attains its object, as other economic individuals do, by the indirect process of exchange, which connotes combination with other individuals for definite personal ends.

To illustrate the positive method here advocated, it may be interesting to note the connection of taxation with the Science of Economics. The payment of a tax involves the destruction of an equal amount of economic goods, and must therefore be considered in economics as an act of consumption. The consequent destruction or consumption of the economic quantity results, or should result, in the creation of a social good, of greater "weal" value. In sociology, therefore, taxation must be regarded as productive, but in economics as unproductive. What the science as a science should especially concern itself with is how the ascertained incidence of any given tax will affect the rate of profit and, through its effect on profits, the rate of wages, interest, and rentals, the accumulation of capital, the use of land, the employment of labor force, and the spirit of enterprise. Here, for the illustrative purpose of showing the difference between the present and the positive methods of economic investigation, I cannot refrain from calling attention to a tendency of taxing buildings, now wholly overlooked, but which could not for a moment have escaped the positive investigator. Shelter is a service performed almost wholly by capital. A tax on shelter is a very serious deterrent to accumulation, as it necessarily narrows the field for investment, on the widening of which field the possibility of continued accumulation depends. Paying a tax on shelter, therefore, costs the community not only the tax itself, but all the interest and profit it would have derived from the

additional accumulation of capital the tax has rendered impossible; and it is easily conceivable that this loss to the community, together with the tax, may be several times the revenue derived by the State from taxing shelter. It is evident that a tax on ground rentals, or on incomes, or a tax on services, or on products whose value comes mainly from wages, would not have anything like as serious an effect upon the field for investment and upon accumulation.

The exceedingly narrow definition of Economics at which we have arrived will doubtless be very distasteful to many economists, who will hesitate to accept it until convinced of its practical advantages. If I am correct as to the applicability of the principles of classification to the moral sciences, the acceptance of the definition would seem to be hardly a matter of liking or disliking, or even one of practical advantage, but of logical necessity. Nevertheless, we instinctively distrust any proposed definition, which fails to afford a gain in either the extent or accuracy of our knowledge. It seems to the writer that the practical advantages of the method here proposed, which he has ventured to call a positive method, and in accordance with which he obtained both his definition of the science and his theory of profit, can be combined under three heads; first, an accuracy and consensus in the use of economic terms, almost or quite absolute from the beginning as to fundamental conceptions and gradually increasing for subsidiary distinctions, as they are studied and comprehended; second, the more practical character of economic investigation; and, third, a gain in positiveness and a lessened dependence on hypothesis. As to the first head, it goes without saying that an accepted method of testing economic definitions and distinctions must rapidly bring about a consensus in the use of economic terms. As to the second head, it will not require any

labored argument to convince us that a sufficient understanding of the inter and outer relations of such human activities as are combined for personal purposes would enable us to resolve any and every practical economic problem. And while economists have incidentally formulated many, perhaps most, of these relations, they have never, as I have shown elsewhere, systematically investigated them. Nor could they be so investigated for two reasons. For lack of a definition of the science itself it has not been perceived that the field of positive economic investigation is confined to these special relations. And, from misapprehension of the *entrepreneur* function, no one has appreciated that it is only from the standpoint of enterprise that these relations can be systematically grouped in orderly arrangement.

Moreover, the group of phenomena which, according to the definition of Economics here submitted, constitute the scope of the science, are so closely related and interdependent that, to be rightly understood, they must be separately investigated, either as constituting the science itself or as a separate department of the science, as phenomena differentiated, as this group unquestionably is, from all other phenomena by the most radical distinction discoverable, cannot, of course, be accurately comprehended when their distinguishing peculiarity is not utilized as the basis of their investigation.

The third advantage claimed for the method I am advocating will demand more careful attention, as economists generally will be loath to admit that present methods and results are in any way lacking in positiveness. It is essential, therefore, to examine into what constitutes the positiveness of a deductive science. As I understand the matter, a positive result is one in proved agreement with actually existent facts. Its agreement is with objective things, and is, therefore, theoretically capable of verification by observation and experiment, although it often

happens that practical verification is impossible, because of physical and mental limitations to observation and experiment, in which case, of course, its positiveness is unverified, although the agreement may really exist. A hypothetical conclusion, on the other hand, while it may be just as true as a positive one, accords not with any actually existing thing or circumstance, but only with what would necessarily occur under circumstances that are assumed: its agreement is with subjective, not objective conditions. Now, of course, when hypothetical assumptions happen to accord with objective realities, the hypothetical conclusion will also accord with the positive result; but the conclusion does not itself become positive until one of two things is proven. Either the accordance between the hypothetical result and actual facts must be indubitably shown by observation and experiment, or we must go back to this assumed hypothesis and prove its accordance with the objective reality. Or, in other words, hypothetical results can be made positive by the verification of either premises or conclusions.

The scientific value of hypothesis lies in its suggestiveness. The human mind is so constituted that it cannot resolve any complicated mass of data without its aid. The hypothetical or metaphysical stage of a science is an absolutely necessary phase of its evolution; and the hypothetical method is so far from meriting condemnation that its pursuit, so aptly spoken of as "the exercise of the scientific imagination," is the field in which the highest powers of the human intellect have been exhibited. The diviner and suggester of truth must always precede and guide the prover. Nevertheless, a real science, because it is a body of organized knowledge, must be wholly built up of proven truth; and a positive science, of truths which are objective.

Now, as we have already observed, the moral sciences can never hope to avail themselves of the exact verifica-

tion which can alone establish the positiveness of their results. Neither observation nor experiment, nor statistics and historical inquiry, can do more than endow deduced results with a varying degree of probability. It follows, therefore, that they can only become positive by establishing the objective reality of their premises. The deductive process itself is positive,—indeed, almost mechanical and quite infallible. An Australian savage and John Stuart Mill would necessarily reach like conclusions in all cases in which their comprehensions of the premises were identical. A deductive result is, therefore, a positive result whenever it has been deduced from positive premises, provided, of course, all the essential premises have been included in the process. Now how can premises be positively established? As we have already seen, a secondary premise can be established deductively, and may be just as positive as the primary premise from which it was deduced. But an original or fundamental premise must be established inductively; that is, by observation. But, as man is finite, the testimony of observation or induction becomes less and less definite and certain as complexity increases. There are, however, some simple observed facts about which the testimony of observation is absolutely sure. And we must get back to facts of this character before we can claim positive foundations for a deductive science. To illustrate from our own argument the existence of human activities as a class by themselves is just such a positive simple fact of observation, about the reality of which we are as assured as of any physical fact whatsoever. Observation again assures us that there are only three ways of subdividing human activities, and that in only one of these ways—that of method—do economic activities segregate themselves into a clearly defined group; and, again, observation shows us that there are four kinds, and four kinds only, of productive activities. Up to this point at least, I think

we can claim that results are positive. But each step has been gained with greater mental difficulty and labor, and only by the aid afforded by the principles of classification.

I think it is now evident that, up to the time when the Risk Theory of Profit was promulgated, not a single fundamental economic premise had been positively or exactly established by the old method of unsystematic observation. The general class of which Economics is a sub-class had not been ascertained. Not only had no generally acceptable definition of the science itself been promulgated, but by implication at least its subject-matter was supposed to include things too dissimilar to be possibly included in the same class. The assumption that land, capital, labor, and co-ordination were the productive factors, necessarily implied that this general class included two kinds of physical things,—land and capital,—and three kinds of energy,—the physical energy and the mental energy involved in labor, and another kind of mental energy involved in co-ordination. Not only was the distinguishing function of the fourth factor of production greatly misconceived, and its dynamic nature and controlling and directive influence minimized, but the distinctions between land and capital, as has been shown elsewhere, were not entirely apprehended; and, while the fundamental distinction between wages and profit was insisted upon, the corresponding fundamental distinction between labor and entrepreneurship was denied, as the co-ordinator was regarded as a kind of laborer.

On the other hand, the method here advocated seems, even in this very inadequate presentation of its process, to have positively established: first, the general class, of which economic phenomena are a sub-class; secondly, a logically indisputable definition of the science itself; thirdly, the existence of an entirely overlooked productive factor which I have called enterprise, for, as everybody now acknowledges that a peculiar net income arises from

the assumption of risk, there must be five productive factors if those are right who consider co-ordination to be one of them; and, fourthly, it promises, despite greater difficulty in attainment, equally positive results in the subsidiary classifications, distinctions, and nomenclature of the science as the result of further study, observation, and research under the guidance and regulation of the test supplied by the principles of classification. Surely, the above attainments afford some foundation for the claim of greater positiveness that I have made. Now what is the difference between the old and the new method? Is it not this? The new method verifies its premises,—a thing we have shown can be accomplished and has been accomplished, so far, at least, as fundamentals are concerned. The old method makes no attempt at positive verification of premises; and, though it has furnished us with a vast and valuable amount of extremely probable truth, it cannot have established anything with absolute certainty, because verification is lacking at both ends of its logical chain.

This is another respect in which the old method is less positive than the new. However soundly established premises may be, deductions founded upon them will not give us positive results so long as any essential premise is omitted. The definition of the science itself and of the fourth productive factor are necessarily implied premises of every economic deduction; and it was, therefore, manifestly impossible for the old method to yield any positive results until it had defined the science itself and resolved the nature of profit, both of which it has failed to do.

Of course, the same difficulty of being sure that essential premises are not ignored will confront us throughout all our subsidiary economic deductions, and will even become intensified as we advance further and further from our original premises, however positively established the latter may be. Though the new method, even in this respect, is less liable to error than the old, because the

application of the principle of classification cannot but tend to the discovery of omitted and suppressed premises, we cannot always claim an absolute positiveness for the results obtained by it, but only a relative positiveness as compared with those of the method hitherto pursued. Any lack of absolute positiveness is, however, not due to the method itself, but to limitations to our ability to apply it.

The question naturally arises as to how much a narrowing down of the Science of Economics, as is here indicated, will affect the present body of economic doctrine. It is evident in the first place that, besides the hypothetical conclusions, a great deal that now passes for Economics is not economic at all, but belongs to the wider sphere of a science concerning itself with all human activities,—the science, that is, of human motives. For instance, a balancing of considerations or an act of valuing is the necessary precursor of every possible action, whether that action be individual, social, or economic. Even the term "exchange value" is not peculiar to Economics, unless the exchange contemplated is only that between different individuals, or, rather, when purchasing power alone is regarded. The mere foregoing of one thing or purpose for another thing or purpose is as common in individual and social as in economic actions. The general laws applicable to all human activities are, of course, necessary data for the study of the peculiar class of activities known as economic; but regarding these general laws as peculiarly economic leads to the obliteration of the distinctions between economic and other activities. Economists require a knowledge of these more general laws; and, if others have not established them, economists must investigate them for themselves; but it is a matter of imperative scientific importance that they should regard them as data of Economics, and not as pertaining exclusively to the narrower sphere of their special science. To

point out the instances where economists have wandered beyond the true confines of the science, on the one hand, into the sphere of individual activities, and, on the other, into the sphere of social activities, and the supposedly economic theories that are vitiated by the intrusion of a metaphysical element, would involve an extended analysis of economic literature impossible here. I will call attention for illustrative purposes to the mooted question whether Economics is a department of Sociology. The answer depends, of course, on the meaning we attach to Sociology. If we consider it as the Science of Combined Actions, Economics, as here defined, is a branch of it. For the other branch, by the way, no name has yet been invented or supposed to be necessary. On the other hand, in the broader scope of this science towards which economists are drifting, Sociology must be considered as a branch of Economics. If, on the other hand, we consider Sociology as the study of actions with a social purpose, it is entirely distinct from, and exclusive of, Economics as here defined, although, as has been already pointed out, there is a class of combined actions entered into by some of the combinants from economic and by others from social motives. This latter content is, of course, what is generally intended in the use of the term, and it would appear that any one suggesting that Economics is a branch of Sociology cannot have any clear idea of either of these sciences; and the suspicion arises that many sociologists have used the term "Sociology" in both senses, without being aware of the difference. This ambiguity is, however, only the natural result of the lack of a satisfactory definition of the science itself, which Sociology suffers from even more than Economics, and for the supply of which, by the way, the same analysis can be utilized which has afforded us our definition of Economics.

Again, the time-honored and classical division of economic tendencies into laws of production, laws of distri-

bution, and laws of consumption, is shown to be meaningless. Consumption is an individualistic act, and not an economic act in any possible sense. There can be, therefore, no economic laws of consumption. That is not to say, however, that economists must ignore consumption; for facts of consumption are undoubted economic data. What is here affirmed is only that Economics is confined to productive human activities, and has nothing as a science to do with consumption, except as the character and methods of consumption react upon the power to produce. Neither has Economics anything to do with the means of production; for that would make the science inclusive of technology, biology, chemistry, and numerous other sciences. It only regards the effect of the distribution of the product upon production. Economic laws of production are identical with economic laws of distribution, the only distinction being in the point of view from which they are regarded. Or, in other words, the field of the science, so far as interrelations are concerned, is the effect upon production of its prearranged distribution as personal income, simply because the science is a study of methods. Several economists, notably Professor Clark, have noticed this relation of production and distribution; but I am not aware of any one's having called attention to consumption being necessarily non-economic.

It seems that of late years there has been a marked tendency among economists to widen the field of economic research and discussion until at present they seem to be rapidly converting the science into the study of all human activity and motive. This development is in the inverse direction to that of the natural sciences, in which there has existed as marked a tendency in each towards the subdivision of fields of inquiry,—a subdivision that has invariably been the precursor and accompaniment of more exact knowledge, not only in subsidiary fields, but in the broader field that has been subdivided.

Coincidentally with this tendency to stray beyond the proper confines of the science and in unconscious recognition of it, economists have exhibited of late two tendencies in the opposite direction, from which, however, I fear no valuable results can be anticipated as long as the first tendency is adhered to. Due to an intuitive perception that their researches were not leading to the positive and practical results that would enable the science to speak with authority as to every-day affairs, they have endeavored to attain such positive and practical results in two ways; namely, by the historical or empirical method, and by the application of statistics.

It is needless to point out that the historical method, of which at one time many entertained hopes, has failed to yield us much positive and practical knowledge. The subject is too complicated, and economic facts too heterogeneous, for the discovery by this method of any but the most initial and self-evident data; and these had been collected by observation and duly formulated, with the exception of enterprise and profit, long before the advocates of the historical method appeared on the scene.

As to the application of statistics, the same remarks are true, so far as it is included in the historical method. And as to the other and only really practical use of statistics, that for verification and quantitative determination, there is ground for fearing that statistical investigation is at present responsible for more misconceptions than truth. This is not the fault of statisticians. They can only work with the tools economists place in their hands, and hypothetical and incomplete conclusions are alike useless for their purposes. It is evident that statisticians cannot investigate the quantitative relations of tendencies until they understand all the tendencies to be measured and until it is positively established just how these tendencies are related to each other. The ignoring of any tendency having a bearing on the result sought vitiates the inves-

tigation, so that the real resultant of existing tendencies may be the exact opposite of that the figures seem to show; and in all such cases serious inaccuracies must arise.

Of course, the accumulation of a knowledge of economic tendencies that will enable statisticians to attain reliable and authoritative results will be a Herculean labor for investigators by the positive method. A good deal, of course, — and I would not seem to underrate it, — has already been accomplished under the old method, and all this narrower but more positive method will have to do will be to verify and supplement these conclusions and place them in their proper relations; but these previously determined conclusions will all, or nearly all, require certain modifications due to the controlling position of enterprise having been disregarded. They have been mainly arrived at by attributing a direct influence to one subsidiary productive factor, or its incentive, upon another subsidiary factor, or its incentive: whereas any such influence is necessarily exerted indirectly through the effect produced upon profit and enterprise. A rise in wages, for instance, has no direct effect upon either interest or rent or upon the accumulation of capital or the appropriation of land. Its whole effect is first expended upon profits; and it is the consequent change in profits stimulating or depressing enterprise which finally modifies interest, rent, accumulation, appropriation, and the employment of labor.

The application of the positive method here advocated, founded upon an exact definition of the field of the science and a recognition of all the fundamental productive factors, and the rigid application of the principles of classification to all subdivisions of the subject, together with the rejection of all hypothetical assumptions, must result in the organization of economic principles, which can alone entitle Economics to be recognized as a true science. This orderly arrangement will disclose great gaps in our knowledge, which have been unnoticed while the subject was

studied by means of deduction from imperfect original premises. Who, for instance, has studied the forces governing the accumulation of capital? Surely, there are laws of accumulation; but I am not cognizant of any systematic and comprehensive attempt to discover and formulate them; and I venture the prediction that, when they are formulated, accumulations will be found to arise from the proceeds of labor that would otherwise have been unemployed, or in other words, that the amount of a nation's capital depends almost wholly upon the opportunity for profitable investment. Who understands the relations between interest and profits? Who has satisfactorily explained the variations in the amount of employment? Who has given any attention to the fact and its effects, that some industries have two or three times the "per capita" productivity of others in which the rates of interest and profits are the same? Many economists actually use "productive" and "profitable" as synonymous terms. Who has noticed the circumstance that, when in any given community the rate of money wages is the highest, the rate of real wages is necessarily at the lowest? Or that, when the rate of real wages is the lowest, the aggregate of real wages is the greatest? And how do these facts—for they are facts—affect interest, rents, and profits? One could go on indefinitely asking questions similar to these, to which the only reply could be that it does not seem to have occurred to anybody to investigate these particular problems. And a very casual inspection will disclose to us that a great many interrelations of the productive factors, and their incentives, have not yet been systematically investigated. The point I wish to make is that under the Positive Theory of Economics here advocated these, and others like them, are the very problems that will suggest themselves; and they contain in their womb the answers to the questions the world has been vainly asking of Economics since the foundation of the science.

FREDERICK B. HAWLEY.

THE RISE AND SUPREMACY OF THE STANDARD OIL COMPANY.*

THE rise and progress of the Standard Oil Company, from its inception in 1865 till its control, in 1878, of 95 per cent. of the oil business of the United States, has presented itself to different critics in somewhat different characters; certain conservative writers think it was largely the result of discriminations in freight rates, extorted by more or less questionable practices from the easy virtue of the railroads. But just why the railroads found it expedient to grant such unusual favors, and why this particular group of men, above all others, proved best able to extort such favors, no one has satisfactorily explained. Corruption of the railway officials has been vaguely suggested; but it has not been shown whence this group of men had the means to suborn the railways, and no writer has been able to point to a piece of precise evidence, found by any court or investigating committee in the United States, which proved such subordination of railway officials, though it is not inconceivable that some evidence may exist. Congressional and legislative committees, on the other hand, and the more cautious writers on Trusts, have been equally put to it to find in those acts of the railways which eventually made the Standard Oil Company supreme any self-interested motives. The fact of the discrimination in freight rates seems to account for the supremacy of the Standard Oil Company. But why those refiners identified with the Standard Oil Company, instead of some other group of refiners, should persistently have obtained the best rates, has been, to these investigators, a baffling mystery.

The secret of this strange success with the railways is not, however, completely insoluble. If the episodes in the progress of the Standard Oil Company from 1865 till 1877 be carefully studied, the motives of every act, both of the company

* This paper won a Bowdoin Prize in Harvard University during the year 1906-07.

and of the railways, will certainly be revealed. The materials for this study are not lacking. A vast amount of evidence showing the ability of the Standard Oil Company to turn these possibilities to advantage has been gathered by various commissions and investigating committees. With such sources of information as these available, an intelligible narrative may readily be put together. Not only may each act of the company and of the railways be authenticated, but also, at each step in the progress, the increasing efficiency and importance of the company may be estimated, and the momentary opportunities of railway and industrial conditions may be gauged. And so in what seems at first sight an unaccountable and suspiciously rapid growth may be discerned signs of inevitable development,—the operation of motives which are, at any rate, explicable.

I.

1865-70.

In 1865, when Mr. John D. Rockefeller began in a small way to refine petroleum at Cleveland, Ohio, the oil industry was in a singularly inchoate state. With the success of Drake's oil well at Titusville, Pennsylvania, in 1859, refiners had been released from the necessity of distilling coal into petroleum before refining petroleum into kerosene; and at the same time the sources of petroleum were shown to be enormously greater than they had ever before been guessed. This discovery stimulated consumers to increased use of lubricants and burning oils and in this way rapidly increased the demand in the arts for the refined product. In even greater measure it encouraged the production of crude petroleum. Within a year after Drake's success, wells had been sunk all around Oil City and along the Allegheny River. In 1864 had occurred the Cherry "run," followed by the Benninghoff and the Pioneer "runs," and the sensational exploitation of Pithole Creek. While Mr. Rockefeller was erecting his little refinery, Pithole City—now a field sown with wheat—had a post-office nearly as large as that of Philadelphia. From Manitoulin Island to Alabama and from Missouri to Central

New York, wells had been bored for oil. So rapid had been the increased demand for the products of petroleum, and so unexpected had been the increase of supply, that in 1865 existing refineries proved quite inadequate to the business suddenly thrust upon them.

The difficulties besetting refiners in 1865 were chiefly such as could be cured by an increase of capital. In 1861 the best wells had been thirty miles from the railroads. Because of the lack of barrels and the difficulty of transportation, petroleum had fallen from \$20 a barrel to almost nothing. By 1863 boats had begun transporting petroleum down Oil Creek, and small pipe-lines and branch railway lines had been built. In 1866 a more efficient cylinder refining-still was invented, casing and torpedoes were coming to be used in drilling, the tank-car began to replace the clumsy flat-car with its wooden tubs, and pipe-lines regularly transported petroleum from the wells to the railroads. To secure these economies in refining, small concerns must either increase their capital to about \$500,000 or else combine into this larger and more efficient unit of production. Mr. Rockefeller was among the first to see the exigency; and in 1867 he united into the firm of Rockefeller, Andrews & Flagler the refineries of William Rockefeller & Co., Rockefeller & Andrews, Rockefeller & Co., S. V. Harkness, and H. M. Flagler. The reasons for this union, as he afterwards stated them, must even then have been evident: "The cause leading to the combination was the desire to unite our skill and capital, in order to carry on a business of some magnitude and importance in place of the small business that each had separately heretofore carried on."*

With the reorganization of the firm of Rockefeller, Andrews & Flagler, in 1870, into the Standard Oil Company of Ohio, with capital stock of \$1,000,000, the first period of the oil industry may be said to close. No company had sought, or, indeed, has since sought, to control the oil fields. So far as may be known, no refiner had yet organized the pipe-lines to his exclusive advantage or exacted of the railroads better freight rates than were granted to his competitor. The trans-

* *Report of the Industrial Commission, 1900, p. 790.*

portation of oil by rail and by pipe-line was left to independent companies, and it was only by the competition and by the improvements of such companies that the cost of the transportation had been reduced. Till 1870 the competition of refiners was solely concerned with efficiency of production; and, since this was to be gained only by refineries of \$500,000 capitalization or more, there was concentration among the stronger concerns and extermination of the weaker. By its process of concentration, and solely on account of its superior efficiency, the Standard Oil Company of Ohio became in 1870 larger than most of its competitors, and produced 4 per cent. of all the oil refined.* After 1870 the progress of the oil industry, generally, and the precedence of the Standard Oil Company, in particular, was to lie in the direction of cheaper transportation exacted of the transportation companies by the refiners.

II.

1870-74.

Though the progress of the oil industry from 1865 till 1870 be said to have determined the most efficient unit of production, and though the advance of the next seven years be said to consist in cheapening the transportation of oil, yet it must not be forgotten that a considerable advance in

*Evidence as to the capacity of the Standard Oil Company of Ohio in 1870:—
B. B. Campbell (a prominent opponent of the Standard Oil Company) (*Investigation of Trusts*, Congress, 1888, 116):—

"Question. How large at that time [1870] was the interest of those who now represent the Standard Oil Trust?

"Answer. Not much larger interest, I should judge, than some of their competitors."

Charles T. Morehouse ("Hepburn" Report, New York, 1879, 2934):—

"Q. Now tell us what was their [the Standard Oil Company's] capacity then [1870] as compared with other works at Cleveland and other points?

"A. Not as large as some of the other works, . . . but comparing very favorably with such works as Charles Pratt & Co. and three or four in the oil regions."

Lewis Emery (at present the most prominent opponent of the Standard Oil Company) (*Report of the Industrial Commission*, 1900, 648):—

"Mr. H. M. Flagler swore they had a capacity of six hundred barrels per day of crude oil in their refinery, the production at that time [1870] being about sixteen thousand barrels a day. That would give them 4 per cent. of the refining business at that time. At that time there existed in the oil country, spread from Louisville, Kentucky, to Portland, Maine, more than two hundred and fifty refineries."

refining took place in this later period. Large refineries soon began manufacturing for their own use barrels, tin cans, boxes for enclosing cans, paint, glue, and sulphuric acid. By experiment the process of distillation was made applicable to qualities of petroleum which previously had been almost useless. By improvement in the details of refining, more durable machinery, tanks, and pumps were constructed, and a better illuminant was produced at less cost. In 1875 a method had been devised of utilizing the residuum of crude petroleum left after the manufacture of illuminating oil; and, after the example of the shale works of Scotland, the process of refining lubricants and paraffine wax from the waste that previously was used as fuel had been adopted in the larger refineries. These improvements, however, were by no means so considerable in the period from 1870 till 1877 as the advantage from the control of transportation; and, though they rendered unprofitable those refineries which could not buy better machinery or utilize their residuum, they were quite too generally adopted by large refiners to account for the growing pre-eminence of the Standard Oil Company.

From 1870 till 1877, then, the struggle of the refiners was chiefly for transportation facilities. Until the issuance of the so-called "Rutter Circular," in 1874, the advantage they sought lay chiefly in discriminating freight rates. From 1874 till 1877 the large refiners sought both to obtain special rates from the railroads and to organize into systems for their own advantage the bewildering network of pipe-lines that had been building since 1869. By surpassing skill in both regions of activity the Standard Oil Company grew in seven years from a concern controlling 4 per cent. of the refined oil output into one controlling 95 per cent. Organization of the pipe-lines came late, because of the excessive amount of capital it demanded. Opportunities for discriminating freight rates, however, presented themselves early. How the Standard Oil Company availed itself of the unique railway conditions and of the practices common in the freight traffic of that time is one of the most sensational episodes in the history of American railroads.

By 1871 the New York Central, the Erie, and the Pennsyl-

vania Railroads had completed connections that afforded them entrance to Chicago, and the great struggle for the traffic of the West had set in. The roads were so poor, and the necessity for revenue so great, that rate wars had begun as early as 1869, when the New York Central and the Pennsylvania roads had secured connection with Chicago. With the entrance of the Erie road, and, in 1874, of the Baltimore and Ohio, into Chicago, the competition for traffic throughout the region of the trunk lines became more embittered. During the years from 1869 till 1873 the agents of the roads met annually at New York to agree upon freight rates; and afterwards, in order to get traffic, they regularly broke their agreement. Every year during this period fourth-class rates from Chicago to New York fell from about 80 cents per 100 pounds in December to about 25 cents in August and September. This reckless competition for traffic was extended to the oil regions. The Pennsylvania Railroad, which had the earliest and closest connection with the centre of petroleum production at Oil City, hauled oil to Pittsburg, a distance of eighty miles, and to Philadelphia, a distance of four hundred miles.

The Erie Railroad, which had no direct communication with the oil country, effected an entrance by a connection with the Atlantic & Great Western road, and hauled oil from Oil City to New York, a distance of five hundred and fifty miles. The New York Central Railroad entered Oil City by connections at Cleveland, and hauled oil to New York, a distance of seven hundred and forty miles. Just as agents of the roads had annually agreed upon a rate from Chicago to the seaboard, making the charge 80 cents by each road with a differential of 5 cents in favor of Baltimore and Philadelphia, so in the case of the oil traffic the same rate was charged by each road on oil moving from Oil City to the seaboard. The effect of this "group-rate" was naturally displeasing to refiners at Pittsburg: it deprived them of all geographical advantage, and enabled their competitors at Cleveland — among others, the Standard Oil Company — to ship oil seven hundred and forty miles by the New York Central Railroad at precisely the rate they were charged for a haulage of four hundred miles.

Clearly, this was a coincidence in rates not based upon any

corresponding coincidence of cost, and as such constituted a case of discrimination. The competition of the railroads, however, was so fierce as to make no other adjustment practicable. In the practice and theory of railway rates, moreover, ample economic justification is to be found.

Because of the futility of basing rates on cost of service, a system of freight rates has arisen which favors certain classes of goods, certain localities, and certain individuals. By lowering rates on cheap goods, by lowering rates at competitive points, and by lowering rates to benefit growing concerns, the revenue of the railways is greatly increased with very slight increase in its expenses. By lowering rates in those three ways, then, and charging "what the traffic will bear," the railways may do business most cheaply, give lowest rates, and make the most profit. In pursuance of this principle, discriminations of the first sort have been practised from the earliest times. "Group-rates"—a form of the second sort of discrimination,—have been freely made since 1869, when the railways first made the rates uniform on all the routes between the competitive points of New York and Chicago. Similar "group-rates" have since been established in the coal traffic from the anthracite regions to the seaboard, and in the fruit traffic of California and Florida. The prominence of such "group-rates" in the pooling agreements of the trunk lines in 1873, 1875, and 1877, and in the "South-western pooling agreements" of 1879, show how general was their acceptance. So fundamental, indeed, have they become in American railway tariffs that the Interstate Commerce Commission has repeatedly sanctioned them.* Discriminations of the third sort were common throughout the period from 1870 till 1874, and by 1875 the "evening system,"—a form of the third class of discriminations which the South Improvement Company closely anticipated—had become especially prominent in the cattle business between New York and Chicago.†

* In the milk cases (*Report of the Interstate Commerce Commission*, II. 278; VII. 97) the principle of the "group-rates" is interestingly discussed from the most conservative standpoint.

† The principle of the "cattle eveners' agreement" has been stated as follows: "The trunk lines leading to New York agreed upon a per cent. of the business which each road should receive, and appointed three cattle eveners,

These various sorts of discrimination, then, — special tariffs, "group-rates," and "evening systems," — must all be regarded as practices inevitable in the railway management of the period, — as essential consequences of railway economy in its development.

In one way or another, every advantage obtained in rates by the large refiners at Cleveland, in the period from 1870 till 1874, may be classified under one of these three sorts of discrimination. As soon as oil became a prominent export, they benefited, with all other refiners, in the special rates on oil in barrels and in tanks. Under the "group-rates" on oil from Oil City to the seaboard, they enjoyed local discrimination, — a discrimination doubtless annoying to refiners on the shorter routes, but not essentially different from that of the "group-rate" from Chicago to New York, or those later enforced by pools and authorized by the Interstate Commerce Commission. And in 1872 they obtained from the railroads, under the abortive contract of the South Improvement Company, an "evening arrangement" that, whether wrongly or not, has since become a hissing and a by-word with every opponent of the Standard Oil Company.

Early in 1871 the advantage of Cleveland over Pittsburg, as a refining centre, had become evident. Cleveland not only enjoyed the same railroad rates that Pittsburg had, but also had water communication to the East by way of the great lakes and the Erie Canal. Pittsburg depended almost entirely for transportation upon the railroads. Cleveland, however, could at any time avail herself of the competition of rail and water transportation by taking to lake vessels whenever the charges of the New York Central Railroad were unsatisfactory.

Cleveland, as a competitive point, had the oil traffic of the New York Central at her mercy. Unless the refiners at Cleve-

whose duty it was to see that the shipments were made over all the roads in the agreed proportions; and for that service they were to receive \$15 a car... on every carload of cattle shipped from the West to New York, no matter by whom shipped... The commission was later reduced to \$10. Now every man is made his own evenner; i.e., if he ships his cattle by the road he is requested to, he gets a certain price; if he ships contrary to directions, his price is made \$10 higher; and this is said to work very well, the rates via all routes of course being the same." *Report of the "Hepburn" Committee, New York, 1879, 69, 70.*

land were allowed low freight rates, the New York Central must see its traffic directed to lake vessels. As the danger of such loss became more imminent, the New York Central was obliged to grant greater and greater favors to the refiners. And when, in 1871, an unexpected shift in the centre of oil production threatened the entire refining business at Cleveland, the railroads dependent on this business were stirred to unusual action.

Beginning in 1871, at the Clarion River, remarkable discoveries of petroleum had been made throughout Butler and Clarion Counties, in the region extending five miles beyond Antwerp, and south-westward a distance of fifteen miles to Millerstown and Greece City. "The development southward," says the editor of the *Oil City Derrick*,* "brought about conditions through which some of the most important railroads of the country might be deprived of a share of the oil-carrying trade. The Pennsylvania Railroad, however, was not affected by the transfer of activities from the Venango region to that of Butler and Clarion Counties. The northern railway lines—namely, the Erie and New York Central—were naturally affected by the transfer of operations to distant fields, which they could not reach with their existing connections. The first-named road was materially aided by the gathering lines of the Pennsylvania Transportation Company, operated by Henry Harley; but the New York Central and its connections were left without petroleum feeders of any description." As usual in new developments of territory, the increase in production due to the large capacity of the wells, the over-capacity of the pipe-lines in the older oil fields, and the overproduction of refining plants which had taken place in the last two years,—all these had conspired to make the transportation and refining of oil unremunerative throughout the petroleum country, and especially unprofitable at Cleveland.

To remedy this situation, a combination of the railroads and certain refiners was planned. "It had its inception," to quote again the editor of the *Oil City Derrick*,† "with cer-

* P. C. Boyle, *Report of the Industrial Commission*, 1900, 421.

† Boyle, *Report of the Industrial Commission*, 1900, 421. Mr. Boyle's impartiality has been questioned by opponents of the Standard Oil Company (see *Report of the Industrial Commission*, 1900, 398), but has never been disproved.

tain Philadelphia and Pittsburg refiners, with an agreement for co-operation with certain Cleveland refiners. But philosophical minds, viewing the subject from this distance, are agreed that it had its origin, as a matter of fact, with the railroad interests rather than with the oil interests." The form which this combination took was a contract between the railroads and certain refiners of Pittsburg, Philadelphia, and Cleveland organized into the South Improvement Company.

By an act of the Pennsylvania legislature on May 1, 1871, the South Improvement Company had been created and vested with all the powers conferred by the act of April 7, 1870, upon the Pennsylvania Company. The powers of the company included authority "to construct and operate any work or works, public or private, designed to include, increase, facilitate, or develop trade, travel, or the transportation of freight, live stock, passengers, or any traffic by land or water, from or to any part of the United States."* Of the 2,000 shares of this company, 900 were owned by Messrs. H. M. Flagler, O. H. Payne, William Rockefeller, H. Bostwick, and J. D. Rockefeller, who later were to become prominent in the Standard Oil Company.†

On January 18, 1872, the South Improvement Company effected the desired combination by completing contracts with the Pennsylvania, the New York Central, and the Erie Railroads. According to the contracts‡ the South Improvement Company agreed to ship 45 per cent. of all the oil transported by it over the Pennsylvania Railroad, and to divide the remainder equally between the Erie and the New York Central Railroads, to furnish suitable tankage facilities for shipping petroleum and receiving it at its destination, and to keep records of the amount of petroleum and its products shipped over the railroads both by itself and by other parties. The railroads in return agreed to allow the South Improvement Company rebates on *all* petroleum and its products carried by them, to charge all other parties not less than the

* *Report of the Industrial Commission*, 1900, 807.

† *Lewis Emery, Report of the Industrial Commission*, 1900, 819.

‡ These contracts are printed in full in "*Hapburn*" *Report*, Exhibits, New York, 1879, 418-449.

full rates specified in the contract,* to furnish to the South Improvement Company way-bills of all petroleum or its product, transported over their lines by any parties whatsoever, and, finally, "at all times to co-operate, as far as it legally may, with the party hereto of the first part, to maintain the business of the party hereto of the first part against loss or injury by competition, to the end that the party hereto of the first part may keep up a remunerative, and so a full and regular business, and to that end shall lower or raise the gross rates of transportation over its railroads and connections, as far as it legally may, for such times and to such extent as may be necessary to overcome such competition." The aim of the railroads, as avowed in the preamble, was plainly an increase in traffic: "whereas the magnitude and extent of the business and operations to be carried on by the party hereto of the first part will greatly promote the interest of the party hereto of the second part, and make it desirable for it by fixing certain rates of freight, drawbacks, and rebates, and by the other provisions of this agreement to encourage the outlay proposed by the party hereto of the first part, and to facilitate and increase the transportation to be received from it, . . . the party hereto of the second part covenants and agrees." And for the attainment of that end, the railroads reserved the right to grant similar rebates and advantages to any other party who should furnish an amount of transportation equal to that furnished by the South Improvement Company, and equal facilities for promoting the petroleum trade.

* Rates and rebates according to contract:—

"ON CRUDE PETROLEUM.

	Gross Rate (a).	Rebate (a).
"From any common point to		
Cleveland	\$0.80	\$0.40
Pittsburg . . . . .	.80	.40
New York	2.66	1.06

"ON REFINED OIL, ETC.

"From Pittsburg to New York	2.00	.50
"From Cleveland to New York	2.00	.50"

"This contract provided that the railways should increase the freight to about double what they had been charging on all oil shipped." M. L. Lockwood, *Report of the Industrial Commission*, 1900, p. 385.

(a) For each barrel of 45 gallons. "Hepburn" Report, Exhibits, New York, 1879, 422.

In general outline the contract was very like those subsequently made with the grain-elevator owners in the Northwest, and with the cattle-shippers of Chicago. Throughout this period it was the policy of the railroads to bind to themselves growing businesses, in which, as in the elevator and refining industries, considerable capital and much enterprise were necessary in order to succeed, and by granting to these concerns special rates to build up trade for the industries and traffic for themselves. By this form of personal discrimination the railroads entering New York had built up traffic for themselves and business for A. T. Stewart, who was competing for the market in the Central West with Field, Leiter & Co. of Chicago. Where the competition for traffic was keen, the railroads usually contracted with the strongest shipper or group of shippers to carry freight at a special rate, or else — as in the case of the large cattle-shippers at Chicago and the South Improvement Company in the oil regions — appointed the group "eveners," and in return for a special rebate required it to apportion traffic among the roads according to a fixed ratio.*

Such are the economic grounds on which to judge this contract. Popular judgment, however, was much less deliberate. On January 18 the contract was signed; and, on February 27, the day after the contract went into effect, an excited mass meeting was held at Titusville and an organization to oppose the new company hastily effected. At once a complete embargo was placed on the sale of oil to the South Improvement Company. Committees were hurriedly despatched to the railway officials, to Harrisburg, and to Washington. On March 15 a resolution was introduced into the House of Representatives at Washington to investigate the South Improvement Company. On March 25, in an agreement signed by the independent refiners, the railroads publicly abrogated their contract with the company, and announced that "all arrangements for the transportation of oil after this date shall be upon a basis of perfect equality to all shippers, producers, and

*As to the frequency of such discriminations, see the "Hepburn" Report, New York, 1879, 48-71. The plan of the cattle eveners' contract is contained in the "Hepburn" Report, New York, 1879, 70; of A. T. Stewart's contract, "Hepburn" Report, 482, 808, 1597.

refiners, and that no rebates, drawbacks, or other arrangements of any character shall be made or allowed that will give any party the slightest difference in rates or any discrimination of any character whatever;* and, with this announcement, they issued new rates about 40 per cent. lower than those provided by the contract. On April 6, before it had the opportunity to do any business, the South Improvement Company was summarily deprived of its charter by the Pennsylvania legislature. The company has never since had an apologist. The Standard Oil Company, in spite of its part in the unfortunate combination, has always disapproved of the contract.† And the bitterest reproach which opponents of the Standard Oil Company heap against it is the taunt that the contract of the South Improvement Company was renewed with the Standard "alliance," which was then forming.‡

In the condition which led in 1872 to the formation and the contract of the South Improvement Company lies the fact that must decide economic opinion upon the company. Since 1867, competition in refining methods had ruined most of the smaller refineries. By 1869, all but fifteen had for this reason been obliged to sell out to more efficient concerns.§ In 1869 began the competition between railways that resulted almost immediately in personal discrimination in rates, and hastened

* *Investigation of Trusts*, Congress, 1888, 361.

† John D. Archbold, *Report of the Industrial Commission*, 1900, 540.

"I have no knowledge of any relations on the part of the Standard Oil Company succeeding to the South Improvement Company whatever. I have been an opponent of the South Improvement Company, as you well know. I have disapproved of it in theory, and practically disapproved of it to-day. I want to say that the statements that what was the South Improvement Company is continued in the Standard are not true: if they had been true, I would not have been in it."

‡ Such statements are made by H. D. Lloyd, *Wealth against Commonweal*, 58-60; J. F. Hudson, *Railways and the Republic*, 70-71; E. C. Patterson: "Hepburn" *Report*, New York, 1879, 1693; W. T. Scheide, *Ibid.*, 3706; A. B. Hepburn, *Report of the Committee*, *Ibid.*, 42; B. B. Campbell, *Investigation of Trusts*, Congress, 1888, 364; Lewis Emery, *Report of the Industrial Commission*, 1900, 630-645; George Rice, *Ibid.*, 604. No confirming evidence has been offered.

§ H. H. Rogers, ("Hepburn" *Report*, New York, 1879, 2605): —

"Q. Was the Standard Oil Company at that time [1873] a large producer?
A. Oh, yes!

"Q. Was the Standard Oil Company at that time the largest producer?
A. The largest refiner, yes.

"Q. Where? A. In Cleveland and New York, and I think they had some interests in the oil regions."

the extermination of such refineries as were already declining. Overproduction of oil in 1870 and 1871 had increased the depression, so that in 1872, when the centre of operations was shifted southwards, and ruin threatened the large refineries as well as the small, feeling throughout the industry was extremely nervous. According to their usual practice at that time the railways cast about for the strongest group of refiners with whom they might ally to protect their traffic. That the South Improvement Company was the strongest group of refiners has never been disputed. In 1872 the Standard Oil Company was the largest concern in the oil region, and the combined capacity of the refineries organized into the South Improvement Company far exceeded that of the unorganized refiners.* That the industrial efficiency of the favored company was superior to that of other refiners seems equally demonstrable. By the sheer superiority of its organization, and — so far as is known — quite unaided by unusual discrimination in rates, the Standard Oil Company had obtained in 1872 its pre-eminent position. By similar efficiency of capital and ability other members of the South Improvement Company had survived and grown, while their poorer competitors had suffered from depression. From the railway point of view, then, the situation in 1872 justified a special contract; and in the South Improvement Company was presented the fittest party to such a contract.

Whether the rebate provided by the contract excessively rewarded the company for its services as "evener" is a question of fact, not to be settled off-hand. The violent popular uprising, the quickness with which the contract was withdrawn by the railroads, the reticence and subsequent penitence of all concerned in making it, and the odium in which it has since been held by both friends and enemies of the Standard Oil Company may indeed be regarded as evidence that its provisions were unwarranted. The principle of the contract, however, — the combination of both the railways and the strongest refiners to restore profitable stability to traffic and indus-

* Digest of evidence, *Report of the Industrial Commission*, 1900, 148. "Mr. Emery insists vigorously that it would have been absolutely impossible for any one else to secure the amount of business necessary to meet this requirement of railways."

try,—was inevitable in the practice and theory of railway economics.

The panic caused in 1872 by publishing the contract of the South Improvement Company, though never more than fright,—for the contract was never kept,—still seemed to make the situation more acute. Under the stress of such difficult conditions, small concerns gave place to large, and large concerns combined into yet greater ones. Throughout 1872, 1873, and 1874 small refiners were driven into insolvency or forced into selling. The causes assigned for this are two. "The overproduction of 1873, 1874, and 1875," explains a leading opponent of the Standard Oil Company; "and the consequent almost entire destruction of petroleum values gave the Standard Oil Company, with its organization and capital, almost the desired monopoly."* Discrimination in freight rates in favor of the large refiners was the other and more aggravating cause. For, though they never resumed the contract of the South Improvement Company, nevertheless, at the solicitation of refiners who had signed the agreement of March 25, 1872, the railroads soon resumed the practice of increasing traffic by giving special rates to the large shippers; † and, though their

* Letter of the Delegation of Oil Producers, delivered to the Pennsylvania Railroad September 11, 1877. Quoted in *Investigation of Trusts*, Congress, 1888, 363.

† George R. Blanchard, of the Erie Railroad ("*Hepburn*" Report, New York, 1879, 3594):—

"I was then convinced . . . that the agreement of March 25 lasted less than two weeks, and that at an early date the Empire Line [later the great rival of the Standard] was receiving a large drawback or commission from the Pennsylvania Railroad, which was either being shared with the shippers or an additional amount was being allowed to them. . . . It is, therefore, clear that one of the largest shippers who signed that March agreement did not feel that it bound him to pay the rates he had agreed to pay; and he gave convincing reasons to believe that others, signers and parties to that agreement, did not pay them, and possessed equal or greater advantages by way of rival routes. . . . I opened negotiations to increase our traffic, which resulted in an agreement, with the concurrence of the Atlantic and Great Western, as follows:—

"ERIE RAILWAY CO.,

"OFFICE OF SECOND VICE-PRESIDENT,

"NEW YORK, March 29, 1873.

"MEMORANDUM.

"Between Mr. John D. Archbold [of the Standard], Mr. Bennett, and Mr. Porter, and Mr. Osborn and myself. Rate for March, '73, to be 133 $\frac{1}{4}$ from Union [published rate, \$1.65]. Rate thereafter to be \$1.25 from same point as the maximum for 1873. If the common point rate is made from Titusville at any time in 1873, on *bona fide* shipments, Erie and Atlantic and Great Western will make same rate

motives were — so far as evidence is shown — thoroughly self-interested,* they hastened the absorption of the small refineries by the larger, and especially the expansion of the Standard Oil Company, which was the largest of all. To profit by these discriminations, and immediately by the advantages of concentrated capital, the Standard Oil Company of Ohio increased its capital stock in 1872 to \$2,500,000, and in the same year combined with the Standard Oil Company of Pittsburgh, the Cleveland Standard Refinery, the Pittsburgh Refinery, the Atlantic Refining Company of Philadelphia, and Charles Pratt & Co. of New York — all leading independent refiners — into the Standard "alliance,"† which ten years later was to be the basis of the Standard Oil Trust. "It was a union, not of corporations, but of their stockholders," says the solicitor of the Standard Oil Company. "The several companies continued to conduct their business as before. They ceased to be competitive with each other in the sense of striving to undersell each other. They continued to be competitors in the sense that each strove to show at the end of each year the best results in making the best product at low cost. From time to time new persons and additional capital were taken into this association. Whenever and wher-

from same date. With this rate the refiners agree to give us their entire product to New York for the year, and the preference always at same rate as actual shipment by other lines.

"(Signed)

"JOHN D. ARCHBOLD,

"G. R. BLANCHARD.

... "I also learned at that time that this producers' agreement [of March 26] was exploded by the action of the Producers' Union before that time. . . . These facts effectually refute the testimony of Mr. Patterson, that the agreement of March 26 continued more than two years, or any period beyond three weeks, at the rates it stipulated, and show that at least two of its signers did not feel bound to pay the rates it named, and that they and others by other lines endeavored immediately after it was signed to obtain, and did secure, reduced rates, as usual before its execution, and peddled oil among the railroads wherever they could secure an advantage, however small, over each other on the railroads."

*Mr. Paul de Rousiers has suggested that the motives of the railroad might have been mixed; that their act might have been inspired by inevitable railway policy re-enforced by bribes from the Standard Oil Company. No proven case of bribery is recorded, however, by any investigating committee, commission, or court.

†The official name of the "alliance" was the Central Association of Refiners, Mr. John D. Rockefeller, president, and Mr. Charles Pratt, secretary and treasurer.

ever a man showed himself skilful and useful in any branch of the business, he was sought after. As business increased, new corporations were formed in various States, in the same interest, some as trading companies, some as manufacturing companies."* The motives of the combination, as stated by Mr. Dodd, were all owing to conditions prevalent in the period from 1870 till 1874. "Railroad rates were excessive and lacking in uniformity. When refiners were able to combine and throw a large volume of business to any particular road, they would get favorable rates. The rebate and drawback system was then universal, and was not confined to oil. Undoubtedly, this fact had much to do with the combination of refiners above referred to, and which came to be known as the Standard. But it was by no means the only reason. The men in control of that combination foresaw that a business which had thus far been disastrous would require co-operation on a large scale." †

By early developments of its refining capacity, then, the Standard Oil Company had succeeded in 1870 in controlling 4 per cent. of the production of the oil regions. By 1871 it had so availed itself of the competition between the trunk lines as to enjoy rates equal to those of the refiners at Pittsburg. In the depression of 1872, it had unsuccessfully essayed, with other refiners, to act as "evener" for the railroads. Frustrated in this attempt, it had returned to its policy of concentration,—purchasing small refineries, uniting with large ones, and exacting of the railroads discriminations proportionate to its size. By 1874 the capital of the Standard Oil Company of Ohio had been increased to \$3,500,000. The control of the Standard "alliance" had been extended over more than half the refining industry, and the combination was ready to enter upon the purchase of pipe-lines. The railroads had not conspired to cause this development,‡ neither could sharp practice in competition account for it. This remarkable increase since 1870 in industrial efficiency must be due to superior ability and capital. This still more striking increase in advantages of

* S. C. T. Dodd, *Combinations*.

† *Ibid*.

‡ It has frequently been stated, though never proved, that railroad officials were financially interested in the Standard Oil Company.

transportation must be due to the same causes, coupled with peculiar opportunities of geographical location and railway conditions. Five years after this supremacy was accomplished, William H. Vanderbilt, in reply to a question before the Hepburn Committee, set forth what seems on the whole the true explanation:—

“Question. Can you attribute, or do you attribute in your own mind, the fact of there being one refiner instead of fifty now to any other cause except the larger capital of the Standard Oil Company?

“Answer. There are a great many causes: it is not from their capital alone that they have built up this business. There is no question about it but that these men — and, if you come into contact with them, I guess you will come to the same conclusion I have long ago — I think they are smarter fellows than I am, a good deal. They are very enterprising and smart men. I never came in contact with any class of men as smart and as able as they are in their business, and I think that a great deal is to be attributed to that.

“Q. Would that alone monopolize a business of that sort?

“A. It would go a great ways towards building it up. They never could have got in the position they are in now without a great deal of ability, and one man would hardly have been able to do it: it is a combination of men.

“Q. Wasn't it a combination that embraced the smart men in the railways, as well as the smart men in the Standard Company?

“A. I think those gentlemen from their shrewdness have been able to take advantage of the competition that existed between the railroads for their business, as it grew, and that they have availed themselves of it there is no question of doubt.

“Q. Don't you think they have also been able to make their affiliations with railroad companies and railroad officers?

“A. I have not heard it charged that any railway official had any interest in any of their companies, only that I have seen in the papers, some years ago, that I had an interest in it.

“Q. Your interest in your railway is so large a one that

nobody would conceive, as a matter of personal interest, that you would have an interest antagonistic to your road?

"A. When they came to do business with us in any magnitude, that is the reason I disposed of my interest.

"Q. And that is the only way you can account for the enormous monopoly that has grown up?

"A. Yes: they are very shrewd men. I don't believe that by any legislative enactment or anything else, through any of the States or all of the States, you can keep such men down. You can't do it! They will be on top all the time. You see if they are not." [*"Hepburn" Report*, New York, 1879, 2605.]

III.

1874-77.

By its economies in refining—attained as early as 1870—and in freight rates—the reward of its predominance in the industry in 1872—the Standard Oil Company in 1873 escaped in great measure the depression which harassed its competitors. This depression, if continued, promised to be disastrous both to the newly formed "alliance" and to its dwindling competitors. In the interest of both parties, therefore, relief was sought in the restriction of the oil production. Throughout 1873 there was a disposition on the part of the producers outside the region of the great wells to suspend operations. In 1874, because of the small inducement to continue, there was an important shut-down in Clarion County.* But these methods of relief were unavailing. Throughout 1874 the weaker refineries were forced to sell to the stronger, who reduced the overproduction at once by dismantling their works, so that in 1874 there were "in the oil regions proper but few refineries, and those universally owned by the Standard Oil Company, those at Pittsburg being owned or controlled by that combination or by the Conduit and Empire lines.† By its supremacy in the oil regions, then, the Standard Oil Company in 1874 had added,

* P. C. Boyle, *Report of the Industrial Commission*, 1900, 427.

† B. B. Campbell *Investigation of Trusts*, Congress, 1888, 364.

to its economies in efficiency and in transportation by rail, the advantage of restricting overproduction, and in the period from 1874 till 1877 was ready to add the advantage of controlling the pipe-lines.

In 1869 the first extended system of pipe-lines—the Mutual Pipe Line—was laid in Clarion County. At the same time William H. Abbott and Henry Harley, with a capital of \$2,000,000, were organizing into the Pennsylvania Transportation Company the five hundred miles of pipe centering at the Miller farm. Vandergrift & Forman were establishing in Butler County a system which was later to be the nucleus of the United Pipe Line System, and the American Transfer Company and the Empire Transportation Company were forming. Such systems, however, were rare until 1874. Most of the pipe-lines were scarcely ten miles long, and extended from Clarion River to some common point of shipment, where stated freight rates were given. Their over-capacity had become so excessive, their competition so ill-considered, and their solvency so much a matter of doubt that by 1874 most of them had been united into the system of Vandergrift & Forman, the Pennsylvania Transportation Company, the Columbia Conduit Company, or the American Transfer Company. Vandergrift & Forman at that time controlled 25 or 30 per cent. of the pipe-line traffic in the oil regions, and the five companies together controlled by far the greater part of the traffic.* Such was the situation when the Standard Oil Company took a hand in the business.

In 1874 the firm of Vandergrift & Forman was re-organized. Its name was changed to the United Pipe Line Company; and its officers were Mr. Vandergrift, president, and six officials of the Standard "alliance" among its nine directors.† In the same year the five great systems of pipe-lines agreed upon a uniform schedule of charges,‡ and the patrons of these systems were allowed to special discriminations by the railroads. This new adjustment contained in the "Rutter Circular" of September 9, 1874, raised the

* M. C. Patterson, "*Hepburn*" Report, New York, 1879, 1693.

† *Ibid.*

‡ W. T. Scheide, "*Hepburn*" Report, New York, 1879, 2769.

charges for transportation of oil nearly to the rates fixed by the contract of the South Improvement Company, and allowed a rebate of 22 cents on all oil coming from the five great systems of pipe-lines which maintained the uniform schedule of charges.* By this new tariff the organization of the remaining lines into one or another system was considerably hastened; and in this process of bringing order into the confused network of pipe-lines the Standard "alliance," the United Pipe Line Company, owned by the Standard Oil Company, and the great systems and their patrons are greatly benefited. With the railway companies the purpose was merely to put an end to the unreliable service of the small pipe-lines, and to secure for themselves a larger and more certain traffic. With the pipe-lines, however,—though each of the allied pipe-lines and every refiner who was served by them shared impartially in the rebate,†—the effect was particularly to build up the larger pipe-line and the larger refiner at the expense of the smaller. For this reason the economies in transportation by

*The "Butter Circular" fixed the following rates on refined and crude oil:—

"The rates on refined oil from all refineries at Cleveland, Titusville, and elsewhere in and adjacent to the oil region shall be as follows:—

	Per barrel.
"To Boston	\$2.10
Philadelphia	1.85
Baltimore	1.85
New York	2.00

"Net rate on Albany, 15 per cent. less, from which shall be refunded the amount paid for the transportation of crude oil by rail from the mouth of the pipes to the said refineries upon the basis of 14 barrels of crude oil to the refineries for every 10 barrels of refined oil forwarded by rail from them [the refineries] to the Eastern points named.

"Settlements of this drawback to be made on the refined oil forwarded during each month.

"No rebate on these rates will be paid on oil reaching refineries direct by pipes.

"On crude oil the rates from all initial points of rail shipments in the oil region shall be as follows:—

"To Boston, \$1.75 per barrel.

"To New York, \$1.50 per barrel (net rate on Albany 15 per cent. less).

"To Philadelphia, \$1.50 per barrel.

"To Baltimore, \$1.50 per barrel.

"From which shall be refunded 22 cents per barrel only on oil coming from pipes which maintain the agreed rates of pipeage. A barrel shall in all cases be computed at 45 gallons." . . .

Investigation of Trusts, Congress, 1888, 263.

†W. T. Scheide, "Hepburn" Report, New York, 1873, 2770, 2794.

rail and pipe-line effected in 1874 tended greatly to increase the predominance of the United Pipe Line Company and the Standard "alliance."

In the year following the United Pipe Line Company acquired, by purchase, the greater part of the pipe-lines which had not participated in the agreement. Combinations among the large systems — the United Pipe Line Company, the Columbia Conduit Company, and the Empire Transportation Company — gradually absorbed all the others. Meanwhile the pipe-lines enjoying the discriminations so abused their privilege by high charges that in 1875 competition from without and suspicion within broke up the agreement. In 1874 the Baltimore & Ohio Railroad had entered Chicago, and was making advances to the Columbia Conduit Company. The railway situation was uneasy; and when, in 1875, the Erie Railroad accused the Pennsylvania Railroad of granting secret discriminations to the Empire Transportation Company, the agreement among the pipe-lines was immediately broken. The Columbia Conduit Company attached itself to the Baltimore & Ohio Railroad; the Empire Transportation attached itself to the Pennsylvania Railroad;* and the United Pipe Line Company, through its owner, the Standard Oil Company, completed an agreement with the Erie and the New York Central Railroads, according to which it gave to each road 50 per cent. of its traffic, guaranteed to the Erie Railroad 27 per cent. of the entire oil traffic in the oil regions,— which was the proportion the Erie Railroad had received under the "Rutter Circular,"— and received in return upon all shipments a rebate of 10 per cent.† The motives of the Erie and the New York Central Railroads were plain. Entering the oil regions by connections from the north, these roads depended entirely for their traffic upon the Standard Oil Company at Cleveland. Accordingly, for the guarantee that its oil traffic would not be diminished, the Erie Railroad could afford to pay roundly; and for the maintenance of the oil industry at

* A copy of the contract between the Empire Transportation Company and the Pennsylvania Railroad is contained in the *Investigation of Trusts*, Congress, 1888, 210.

† The details of this contract are contained in the "Hepburn" Report, New York, 1879, 175, 182.

Cleveland, and for the privilege of handling all its traffic, the New York Central Railroad was ready to grant a liberal discrimination. Therefore, throughout the rest of 1875 all the pipe-lines in the oil regions arrayed themselves with one or another of the three rival pipe-lines and their allied railroads;* and the armed peace thus maintained continued throughout 1876.

In 1877, with the aid of the Pennsylvania Railroad, the Empire Transportation Company secured control of a refinery at Communipaw, and began constructing others at Philadelphia. The roads in alliance with the Standard Oil Company were the first to discover the encroachment, and resented it before the Standard Oil Company had time to act. "Unless checked," said Mr. Blanchard, of the Erie Railroad, "the result would be a diversion largely of the transportation of oil from our roads. The New York Central Road and our own determined that we ought not to stand by and permit these improvements and arrangements to be made, which, when completed, would be beyond our control. We determined, therefore, to make the issue with the Pennsylvania Railroad Company."† At the suggestion of the railroads, accordingly, the Standard Oil Company, by ceasing on March 18, 1877, to send freight over the Pennsylvania Railroad, precipitated a war between the great pipe-lines and their allied roads.

The suddenness and fury of the war for the oil traffic which followed is explained only by the strained relations of the trunk lines at that time. Since 1874, when the Baltimore & Ohio Railroad entered Chicago, there had been a ruinous war of rates. Freight charges during this period from Chicago to the Seaboard had fallen from \$1 to 10 cents. New York Central and the Erie Railroads had lost millions, and the Baltimore & Ohio and the Pennsylvania Railroads had ceased to pay dividends.‡ The struggle in the oil region was, therefore, merely part of a contest extending half across the continent. Beginning fully a month before the larger contest approached

* W. T. Scheide, "Hepburn" Report, New York, 1879, 2705; J. C. Welch, *Ibid.*, 2675.

† G. B. Blanchard, "Hepburn" Report, New York, 1879, 1463.

‡ Report of the "Hepburn" Committee, New York, 1879, 33.

settlement, it continued bitterly for six months until the very last agreements had been signed. In this struggle the Columbia Conduit Company connected with a branch of the Reading Railroad, and controlled the traffic in the newly discovered Bradford district. The Empire Transportation Company meanwhile, aided by the Pennsylvania Railroad, sought by a tremendous effort to crush the United Pipe Line Company and the Standard Oil Company. The Pennsylvania Railroad carried oil at eight cents a barrel less than cost,* and ordered the refineries of the Empire Transportation Company to sell oil in the territory of the Standard "alliance" at any price. But the Standard Oil Company, with its high degree of mechanical efficiency, its well-organized united pipe-line system, and its firm alliance with the Erie and the New York Central Railroads, proved superior. On October 17, 1877, the Pennsylvania Railroad was forced to abandon the struggle, and to sign a contract which gave the Standard Oil Company practically the monopoly of the production and transportation of oil in the United States. According to this contract the Standard Oil Company was appointed "evener," to apportion oil traffic in the following ratio: 63 per cent. of the oil traffic was to go to New York City and 37 per cent. to Philadelphia and Baltimore; of the traffic going to New York City, the New York Central, the Erie, and the Pennsylvania Railroads were each to carry one third; of the traffic going to Philadelphia and Baltimore, the Pennsylvania Railroad was to carry 70 per cent. and the Baltimore & Ohio 30 per cent. By the terms of the contract the Pennsylvania Railroad was guaranteed an annual traffic of not less than 2,000,000 barrels;† and the Empire

* Digest of the *Report of the Industrial Commission*, 1900, 150.

† In a letter of October 17, 1877, Mr. William Rockefeller set forth this contract in five provisions, the last providing as follows for the remuneration of the Standard Oil Company:—

"We ask, in consideration of the above-named guarantee of the business upon which it is understood we shall pay such rates as may be fixed from time to time by the four trunk lines (which rate, it is understood, shall be so fixed by the trunk lines as to place us on a parity as to cost of production with shippers by competing lines), that you shall furnish us promptly all the transportation we may reasonably require, and that you shall allow to and pay us weekly such commission on our own shipments and the shipments which we may control as may be agreed to by your company and the other trunk lines from time to time. This commission, it is understood, has for the present been fixed at 10 per cent. upon the rate, and

Transportation Company was purchased for \$3,000,000 by the Standard Oil Company and the United Pipe Line Company.*

The Standard Oil Company, meanwhile, for its services as "evener" was remunerated in the following fashion: After May 1, 1878, when the contracts between the Pennsylvania Railroad and its shippers expired, the Standard Oil Company received a rebate of 10 per cent. on all its freight. In addition to this it was allowed, with other shippers, a rebate of 68½ cents in order that it might be on an equality with those refineries who shipped by the Erie Canal; and the American Transporter Company, which had now been united with the United Pipe Line Company, was allowed 22½ cents as its share of the through rate.

The Pennsylvania Railroad offered to carry oil for *all* shippers on these terms, except that for the 10 per cent. rebate it asked such considerations as the Standard alone could furnish; and, indeed, for those refiners who made all their shipments over its line, it continued to give rates as low as those of the Standard Oil Company. On December 8, 1878, how-

shall not be fixed at a less percentage, except by a mutual agreement of your company and ours; provided that no other shipper of oil by your line shall pay less than the rate fixed for us before such commission is deducted, and no commission shall be allowed any other shipper unless he shall guarantee and furnish such amount of oil for shipment as will, after deduction of commission allowed him, realize to you the same amount of profit you realize from our trade; that is, you will not allow any other shipper of oil any part of such commission, unless after such commission you realize from the total of his business the same total of profit you realized from the total of our business, except so far as your company may be compelled to fill certain contracts for transportation made by the Empire Line with refineries and producers, which contracts terminate on or before May 1, 1878,—a statement of which shall accompany your reply to the letter; such contracts to be fulfilled. We agree that all the stipulation herein contained shall be carried out by us for the period of five years from the date hereof." . . . *Investigation of Trusts, Congress, 1888, 288.*

*The motives of this act have been thus stated:—

"It was the desire on the part of the Pennsylvania Railroad to have a portion of our other business that induced them to bring about this negotiation with the Empire Transportation Company, and we yielded to their most urgent persuasions. We did not want the property, but they insisted upon it that we should buy it. We did finally yield to their persuasions, and purchased that portion of the Empire Transportation Company's property, meaning the local pipe-lines in the oil regions. We had stated in early discussions with representatives of the Pennsylvania Railroad that we were willing to buy the refineries owned by the Empire Transportation Company; but, as we were not interested in transportation at all, we wanted them to pay for the pipe-lines and own them themselves. But we yielded that point finally." H. M. Flagler of the Standard Oil Company, *Investigation of Trusts, 1888, 773.*

ever, when the Erie Canal was closed, the railroad ceased making such favorable rates for independent refiners; and on March 31, 1879, all payments of rebates ceased.*

In view of the bitterness of the war which it settled, this agreement was very favorable to the defeated party. The Pennsylvania Railroad had gone out of its way to strike at the power of the Standard "alliance," and after expensive fighting had been completely beaten and forced to sue for such terms as might mercifully be granted it. The Standard Oil Company, however, required of it only such favors as it already received of the New York Central and the Erie Railroads, and, in return, guaranteed its oil traffic, purchased its interest in the Empire Transportation Company, and advanced the money to buy oil-cans. It was, indeed, shrewd magnanimity; for, in advancing the money to complete the sale, the Standard Oil Company became the mortgager of the oil-cars of the railroad,† and by aid of the discriminations provided in the contract it was able, in a few months, to drive the Columbia Conduit Company into selling.‡ So that in 1878 and 1879 the Standard Oil Company owned or controlled by contract every transporting agent in the oil regions.

The achievement of this supremacy marks the close of the first phase of the Standard Oil Company. It owned the

* A. J. Cassatt, testimony in *Commonwealth of Pennsylvania v. Pennsylvania Railroad*. Quoted in "*Hepburn*" Report, New York, 1879, 483-519. Summarized by Archbold, *Report of the Industrial Commission*, 1900, 1515.

Expressed statistically, the rates and rebates of May 1, 1878, are:—

Tariff rate on crude oil	\$1.40
Allowance to American Transfer Company . . . \$0.225	
" " Standard Oil Company, 10 per cent. . . 0.14	
" " Standard Oil Company 0.15	0.515
Net rate to Standard Oil Company	\$0.885
Tariff rate on refined oil	1.90
Rebate to all shippers \$0.645	
Rebate to Standard Oil Company 0.485	1.10
Net rate to Standard Oil Company	\$0.80
Net rate to other shippers	1.255

Mr. Cassatt testified that large independent refiners usually receive secret rebates, which sometimes equal those of the Standard Company.

† H. M. Flagler, *Investigation of Trusts*, Congress, 1888, 770-774.

‡ John C. Welch, "*Hepburn*" Report, New York, 1879, 3671.

terminal facilities of the New York Central for handling oil at New York. It leased the terminal facilities of the Erie Railroad at New York. It owned or leased almost all the oil-cars on the Erie, the New York Central, and the Pennsylvania Railroad.* Through the United Pipe Line Company and the American Transfer Company, it purchased, one after another, twenty-six pipe-lines that threatened competition.† And when, in 1879, the Tide-water Pipe Line Company was built to the seaboard, in order to evade the discriminations of the railways, the Standard Oil Company was able, after a struggle of four years, to defeat that, also. The dominance of the Standard Oil Company in the refining industry was even more striking. In 1879 it controlled 95 per cent. of the refineries in the oil region, and at one time during this period there were scarcely a dozen independent refiners in business.‡

IV.

An explicated narrative — such as this has pretended to be — should bear its own judgment upon the agents who accomplished the oil monopoly. That judgment — if the narrative has succeeded in logical clearness — runs somewhat as follows: Given the railway and economic conditions, the progress of the Standard Oil Company was quite inevitable. Since it showed at an early time bright promise of industrial efficiency, it readily acquired, after the fashion of the period, proportionate discrimination in freight rates. By getting control through discriminations of the means of transportation, it inevitably achieved monopoly. In support of this judgment it may be urged — as Mr. Paul de Rousiers boldly urges — that discriminations, “though important in the beginning, went into the background with the absorption of the pipe-lines, and, though very helpful in the creation of the Trust, were not indispensable to its continuance.” Conditions alone, he continues, were such as to make monopoly in some sort inevitable. “Historically, it is a fact; and one does not see how otherwise it

* Report of the “Hepburn” Committee, New York, 1879, 40.

† Report of the Industrial Commission, 1900, 101.

‡ Ibid., 98.

could have obtained, in so quick and complete a fashion, the result towards which it tended." If the Standard Oil Company were not the strongest refiner, its most powerful rival would certainly have seized the same control over transportation that the Standard Oil Company in fact secured. In the last analysis, monopoly by the Standard Oil Company was, under existing conditions, inevitable, simply because it was most efficiently organized.

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TRADE CYCLES AND THE EFFORT TO ANTICIPATE.

A LARGE portion of the business community are accustomed to look upon the commercial crisis much as an epidemic of small-pox was regarded before the days of Jenner,—as a mysterious “act of God,” which cannot be foreseen or understood, and can only be endured with what fortitude the sufferers are able to command. Even in the minds of students of economics it is to be feared that a certain degree of haziness still exists in connection with this subject. The list of reasons which have been advanced at various times in explanation of panics is a long and amusing one. In several recent publications the “sun-spot theory” is discussed with diverting seriousness, and a late issue of a foreign magazine contains elaborate charts endeavoring to establish a relation between poor crops and crises.

It is stated that the late P. D. Armour cabled from Europe early in 1893 to his representatives in America, instructing them to secure and store away in vaults one million dollars in gold. It is known that during the panic, later in that year, Armour & Co. were well supplied with ready money. Evidently, Mr. Armour was able to see in action certain forces which induced him to believe that a crisis was imminent, although the collapse of 1893 took the public completely by surprise. It is equally evident that his action assisted in bringing about the panic which he foresaw. In this article an effort will be made to trace out a little more fully than has heretofore been done the principle which operates to produce trade cycles.

The first point to which attention should be directed is the absolute impossibility in practical affairs of separating speculation from the natural action of demand and supply. Even in the simplest consumptive purchases the element of foresight is frequently present. If a man accustomed to wear a particular brand of shirts sees them for sale at half-price, he is likely to buy an extra half-dozen. He accumulates a stock in the

expectation of higher prices. When the housewife goes to her grocery on bargain-day and finds sugar selling at 5 cents a pound, the ruling price being 6 cents, she will almost certainly purchase more of it on that account in anticipation of future wants. In fact, in cities where the retail stores compete with each other by means of frequent "special sales," the women bargain-hunters become shrewd speculators. Even the school-boy, seeing pencils for sale at 3 cents each, two for 5 cents, will often buy two, expecting eventually to need the second.

Economists have paid much attention to the fact that the buyer will purchase at the cheapest *place*, but have said little about the secondary principle, that he will try to buy at the cheapest *time*. In primitive societies this secondary principle has no application worthy of mention; among wage-earners it is unimportant, though occasionally operative; but with managers, from the apple-woman on the corner to the president of a railway system, it has a scope and effectiveness second only to the fundamental axioms of demand and supply. Society may be roughly divided into the following five groups, arranged according to the degree to which business transactions are affected by the effort to speculate:—

Group 1.—Those who work for wages and buy only for consumption. The attempts of this class to foresee and profit by changes in value are for the most part sporadic and without important influence. Under exceptional circumstances, however, when some striking development has attracted public attention, there may be such a general effort to anticipate future consumption as seriously to derange the normal action of demand. For example, during the so-called Leiter corner in wheat in 1897-98 many persons became so excited over newspaper accounts of the rapid exhaustion of supplies that they purchased at the prevailing high prices sufficient flour to last till a new crop should be available,—a fact undoubtedly influential in bringing about the astonishing absence of consumptive demand which was observable in the final month of that crop year.

Group 2.—Those who work independently, like small farmers and shop-keepers. In the United States this repre-

sents a large portion of the population, and includes some of the most persistent speculators. It is only in the newest and least developed of the agricultural sections that crops are sold as soon as harvested; and the number of farmers who hold their wheat, corn, oats, or cotton with the intention of selling on an advance in prices, is constantly growing. The wider diffusion of information in regard to prices and market prospects and the steady increase in intelligence and range of thought among the farming population are resulting in more and more discrimination as to when produce shall be sold.

During the period of low prices following 1893 the accumulation of wheat, corn, and oats in country elevators, cribs, and barns, was on a scale by no means generally appreciated. In some sections every farmer had on hand from one to three full crops of corn. It is this invisible reserve which has come forward to swamp nearly every corner attempted on the produce exchanges. A considerable number of farmers have even learned the tricks of the speculative trade, and sell their grain as soon after harvest as practicable, purchasing at the same time an equal or double amount of "options" at Chicago or Minneapolis to be carried on "margins" until they consider the price satisfactory,—an attempt to "eat their cake and have it, too," which results profitably only when very discreetly conducted. Others anticipate the course of prices still further by selling their crop for future delivery before it is harvested.

The business of the small storekeeper requires him to anticipate the demands of his customers; and, even if he does not attempt to foresee the actual course of prices, he must necessarily carry a light stock in times of depression and a heavy one during periods of active trade. In handling such commodities as flour or meal, the average dealer will make some effort to buy at favorable times and to reduce his stocks when he fears a decline.

Group 3. Entrepreneurs.—Others may speculate; but the *entrepreneur*, seeking to steer a profitable course between the Scylla of expenses of production and the Charybdis of competitive marketing, *must* do so to be successful. Judgment and foresight are the most essential qualities in the manager of a business enterprise. His earnings of management are

very closely dependent upon his success in carrying out Rothschild's injunction to "buy cheap and sell dear." The manufacturer who buys only when material is immediately needed, and sells his goods at the market price as soon as they are finished, will inevitably fall behind in the race.

In 1897 the Atchison Railway made large purchases of rails to be substituted for the lighter weights previously in use. The advance in price was so great during the time these rails were being laid that the old ones pulled up were in many instances sold for more than the cost of the new. The same road spent nearly all its earnings on improvements and reductions of grade during the time when material and labor were cheap and traffic light, thereby securing greatly increased returns when its business subsequently improved. Shrewd iron manufacturers made quick fortunes by acquiring plants for a song in 1896-97, and getting them in readiness for heavy production during the subsequent sensational advance in prices.

When choice must be made between a manager of great executive ability and one of exceptional foresight, the latter will be selected in a majority of instances. Executive ability can be readily furnished by assistants, but speculative shrewdness hardly ever.

Group 4. Investors.—Those who have capital to invest are certain to apply their utmost ability in seeking to foresee the course of prices for the commodity or security in which they are interested. With the recent great multiplication of corporations whose shares are listed on the stock exchanges, investors show a constantly increasing readiness to sell out when they consider prices high and repurchase a different property or at a different time, so that it is frequently difficult to distinguish between the investor and the unmixed speculator.

Group 5. Speculators.—That a considerable portion of the population is either permanently or temporarily identified with this class is a fact as well known as it is regrettable. At one time or another nearly every one succumbs to the insidious attack of the "get-rich-quick" microbe. "I suppose," said the writer to a sedate Colorado schoolmistress, to make conversation,—*"I suppose every second person in your State has a little mining stock laid away, worth about 15 cents a share."*

"Yes," she replied with unexpected frankness; "but I hardly think mine is worth that much." The recent surprising popularity of margin-trading in stocks is a conspicuous instance of this tendency.

The above cursory outline of the influence upon business of what might be called the *instinct of anticipation* is far from exhausting the subject, but it will suffice to introduce the discussion of trade cycles. The effort to speculate, for the most part unrecognized and often almost unconscious, and in its temporary effect upon demand practically indistinguishable from actual consumption, permeates in varying degrees the entire social structure.

For purposes of illustration it may be well to touch briefly upon stock exchange cycles. It is of course understood that the prices of securities fluctuate in accordance with the earning capacity of the properties represented, keeping pace roughly with the activity of business. This movement is a part of the universal trade cycle and is merely the most conspicuous result of the conditions we are seeking to analyze. But within and subordinate to this broad general movement are numerous *lesser stock exchange cycles*, which have but little connection with the remaining business of the country.

The study of the process by which "margin" accounts are fed, fattened, and slaughtered on the stock exchange would hardly be worthy the serious attention of the economist, were it not for the fact that speculative forces, elsewhere inextricably commingled with demand and supply, are here almost isolated, and can therefore be more readily examined and classified.

The fluctuations of prices on an exchange represent an eternal contest between, on the one hand, investors, who consider (1) the rate of interest, present and prospective, obtainable on capital put into a security at current quotations, and (2) the risk involved, and who make no special effort to forecast the course of prices from day to day; and, on the other hand, the gambling class of speculators, who are entirely indifferent to dividends, earning power, or actual value, provided they can "get right" on the immediate action of the market.

For example, A controls a large capital, which he is always

seeking to invest to the best possible advantage. By judicious selection he finds himself able to secure an average return of 5 per cent. Accordingly, if he sees a railway stock of recognized safety, paying 5 per cent. on a par value of 100, selling at such a price as to yield $5\frac{1}{2}$ per cent. on the cost, he is likely to invest therein some portion of his funds. In a time of declining prices he will probably instruct his broker to stand ready to buy the stock at 91. If prices subsequently advance to a point where this security returns only $4\frac{1}{2}$ per cent. on the current quotation, he will dispose of his holdings, giving his broker instructions to sell at 111. B, however, will buy the stock as quickly at 111 as at 91, provided he thinks it will go higher, and may be equally ready to "sell short" at 91 if he expects a further decline. As with most economic groupings, these two classes shade gradually into each other by imperceptible degrees. The action of the investor tends to lessen fluctuations and is usually beneficial both to himself and to society as a whole, while the action of the gambler tends to widen fluctuations and is invariably injurious both to himself and to society.

The lesser stock exchange cycle may conveniently be said to run from panic to panic, with the understanding that the word "panic" is here used to signify merely a sharp, excited decline in stock prices, which frequently occurs without any apparent effect on other lines of business. The selling which causes a panic of this character is liquidation by disappointed gamblers who bought at higher prices in expectation of a further advance. Many of them are forced to sell out because their "margins" are exhausted. The decline continues until prices reach a level where investors are willing to buy. Their purchases gradually absorb the floating supply of stocks which was pressing upon the market and check the downward tendency.

A period of dulness follows. Any further decline meets a constantly increasing number of standing orders to buy, but the enthusiasm of speculators has been temporarily dampened and there are few purchases on advances. This lasts until the far-sighted begin to see ahead a strong probability of conditions sufficiently favorable to induce active public speculation.

The shrewdest operators begin to buy, paying a slight advance. Others soon perceive that the tendency of the market is upward, and hasten to make their purchases while prices are still relatively low. By this time the market begins to "look strong," buyers are more confident, and a generally advancing tendency, interrupted by numerous reactions, continues until investors find prices high enough to make it to their advantage to begin selling. Then each further rise meets resting orders to sell, until a large number of stocks pass from those who own them as interest-bearing investments to those who buy only as a speculation, and that for the most part with borrowed money.

Two of the tricks in vogue among this class of gamblers may be mentioned, as we shall subsequently find that they have their counterparts in the trade cycle. The "pyramider" buys more and more heavily as prices advance, using his profit on the first purchase as "margin" on the second. For example, he directs his broker to "double the line every five points up," — a form of insanity which would be incredible if it were not so common. The buyer of "calls" pays a fixed price, usually ten dollars a hundred shares, for the privilege of buying within a specified time at a price *above* the present market, his expectation being that before the stipulated period has expired the stock will have advanced sufficiently to give him a profit on the transaction.

When at length sales by investors become heavy enough to start a decline, these reckless speculators are in sore trouble. The greatly increased floating supply of securities is bandied about from one to another at lower and lower prices, bearing sorrow and disaster in its train, till finally the grand air-castle raised by human greed again collapses in panic. The incidental variations of this programme are infinite, as both investors and speculators are influenced by concurrent financial and political events; but the underlying and eventually controlling principles are as above outlined.

It is seen immediately that the differences between the purely speculative cycle and the industrial cycle are much more important than the similarities. *First*, the total supply of securities is practically constant, being neither produced nor con-

sumed in the economic sense of those terms. Some stocks may be retired or exchanged or an issue may be increased if the charter permits, and new companies will be floated from time to time; but under ordinary circumstances these incidental changes in quantity do not seriously modify the general character of the cycle. The speculative principle predominates to such an extent as to be almost supreme. But, in considering the industrial cycle, we have a body of goods never twice the same, constantly increased by production and as steadily decreased by consumption. The law of demand and supply predominates, and the instinct of anticipation has only a secondary influence. We may therefore expect to find the general swing of trade fluctuations so much longer and more varied than the stock exchange cycle as almost to defy comparison.

Second. Securities bear interest or are expected to do so, while goods do not. Consequently, when commodity prices are declining, there is not always present a large body of investors waiting to buy. In the case of an article which is in general use and can be kept indefinitely, like corn, this makes but little difference, as investors know that it will always have value, and that declining prices will check production and stimulate consumption. Hence many are ready to buy at any considerable concession in price. But articles produced to satisfy a particular want may be almost unsalable when that want disappears. If, for example, retailers and jobbers find themselves greatly overstocked with bicycles, owing to any decrease in the purchasing power of the people, the machines may command only a nominal price; for, before the public recovers its ability to buy, the style desired may have completely changed or the sport passed out of fashion. Business men say that such an article is "worth whatever you can sell it for." Accordingly, we may expect that the fall of prices will be relatively more severe in an industrial depression than in course of a purely stock exchange cycle. The latter is discussed here not because of any intrinsic importance, but merely to assist in elucidating a principle.

The trade cycle has been said to include ten or eleven years on an average, roughly divisible into three years of depressed trade, three of advancing trade, and three of excited trade,

followed by a panic. It is doubtful if such a classification is of any real assistance to the student, as it loses in accuracy more than it gains in definiteness. Perhaps the most that can be said is that a panic is always followed by a period of depression, varying in length according to circumstances; a second period of advancing prices and increasing activity, which may or may not be interrupted by important reactions; and a third period of prosperous trade, often accompanied by excited speculation, culminating in a shorter period of contraction, which is usually at some portion of its course sufficiently sudden and severe to be termed a panic.

During the period of depression, production and consumption, partially disorganized and unbalanced by the preceding collapse, gradually readjust themselves upon a smaller scale to accord with the new conditions. The people, as a whole, feel themselves poorer. Many have lost heavily by the depreciation of their property. Every one is economizing, using fewer or cheaper goods. Since consumption is thus reduced, production must be correspondingly cut down. Less money is received as wages, hence less can be spent in consumption, and so on in a vicious circle. The people are spending less because they are receiving less, and are receiving less because they are spending less. The circulation of the body politic has become sluggish. Capitalists have no courage to invest in new enterprises; and those already established are conducted cautiously, if not timidly. Idle currency accumulates in bank and government vaults.

This condition prevails until some event occurs to give prices an upward start. It may be a political change or a new government policy which convinces capitalists generally that the time is favorable for new undertakings and induces them to pay out money as wages for the construction of railways, factories, mines, etc., thus putting into active circulation some of the currency previously lying idle, and increasing the consumptive demand by wage-earners without a corresponding immediate increase in the supply of consumer's goods. It may be heavy government expenditures obtained by borrowing, as in war, mortgaging the future for the benefit of the present. It may be the discovery of extensive gold mines, provided the

new gold is *spent*, so as to increase consumptive demand. If it is merely stored in bank vaults and the owner given credit for its value in dollars, its service in setting trade in motion will be slight and indirect.

Again, the stimulating event may be increased sales of goods abroad, and under modern conditions this is usually the most important feature. Although the commercial relationship of different nations is now so close that a panic in any one of them is felt by the others, the resulting fall of prices is far the most severe in the country which contains the primary cause of disturbance. Consequently, that nation finds itself in a position to sell goods in competitive markets to much better advantage than before. Foreign consumers discover that they can buy cheaper in that country, and an increase in its exports follows.

While sales to other nations are growing, imports are declining. The feeling of poverty among the people lessens their purchases of foreign-made goods, and the fall of prices at home makes it relatively more advantageous for them to patronize domestic producers. Less money is spent abroad by travellers, and interest payments to foreign stock and bond-holders are smaller because of the comparative depression and unprofitableness of home industries.

Increasing sales to other countries and decreasing purchases from them can have but one ultimate result,—the receipt of money in payment of the balance due. Foreign exchange gradually weakens to the gold-importing point, and an inward flow begins. Such receipts cannot pile up in bank vaults. The money is sent to pay for goods, and finds its way, directly or indirectly, to the producers of those goods. For the most part capitalists have anticipated its arrival by payments to farmers for their products and to wage-earners for their labor. Thus imports of gold are speedily converted into effective demand for goods.

The first result of this increased purchasing power on the part of consumers is the renewed activity of established industries. So long as the demand does not exceed the capacity of the favorably situated portion of the existing producing plant, there is little advance in prices.

It is at this stage that the operations of the irrepressible speculator begin to have noticeable effect. During the preceding period of depression there has been little inducement to buy anything in the hope of selling it higher. A few thoughtful men have been expecting history to repeat itself, and the trade cycle to take its natural course; but they have been uncertain when the advance would begin, and the same experience which led them to predict a recovery also taught them that there would be ample opportunity to make purchases after the appearance of definite indications of coming improvement. When this class perceive an actual increase in demand for goods, based upon reasons which seem to them good and sufficient, they accept it as a signal that an era of active trade and rising prices is at hand. A very few have been shrewd enough just to anticipate this increased demand by acquiring industrial plants in advance at low prices. These are the stuff of which millionaires are made.

At this point the effort to profit by foresight is confined almost entirely to investors and business managers. The general public is still sceptical of any permanent improvement. Many farmers take advantage of the first little rise in the price of grain to dispose of what they have carried through the period of depression, and only a few continue to hold and accumulate for a further advance. Small shop-keepers are cautious about increasing their stocks of goods. But shrewd investors are buying up interest-paying properties or those which they believe soon will be interest-paying, and the wide awake *entrepreneur* is increasing his stocks of raw material and is a little less urgent in his efforts to sell the finished product.

Thus the first increase in demand, due to the greater purchasing power of consumers, is closely followed, and in the case of some few individuals even accompanied or preceded, by a second increase caused by the effort to speculate; and, as soon as this combined demand passes the capacity of the favorably situated portion of the existing producing plant, rising prices result.

There soon appears a great pressure of capital seeking investment. During the period of depression there has been

but little accumulation of new capital. The profits of successful enterprises have scarcely exceeded the losses of others. There has been a constant transfer, but very little net increase. Production has been upon such a reduced scale as merely to meet current consumption, without leaving much surplus to be laid by as capital. But, now that trade is again active, there is a steady accumulation of funds in investor's hands awaiting profitable employment. Stocks and bonds are gradually absorbed until they reach prices that yield but a small rate of interest on the investment.

This advance in securities, accompanied as it always is by active stock exchange speculation, calls public attention to the upward trend of prices, and has an important sympathetic effect on commodities. Dealers on the produce exchanges adduce the lively stock market as a reason for higher prices on grains. A constantly increasing number of people begin to perceive that a period of advancing prices is in progress. Some speculate definitely and intentionally, buying what they do not want in the expectation of selling it at a profit. The vast majority, however, merely buy quickly what they would otherwise have bought cautiously, and sell slowly what they would otherwise have sold urgently. In buying, they pay the seller's price; and, in selling, they set their own figures and hold to them tenaciously, thus continually aiding the advancing tendency, but at the same time slightly increasing their stocks on hand.

The next stage may be called the period of new enterprises. Accumulating capital overflows existing opportunities for investment and seeks other outlets. New projects for transportation, manufacture, mining, agricultural plantations, oil wells, etc., find ready support among those whose growing funds would elsewhere net them but a low rate of interest. Some of these enterprises are sound and secure. Others are over-capitalized, and will need to go through assignment and reorganization before reaching a permanently paying basis. Still others are founded upon misrepresentations, and ready to be bowled over by the first passing breeze which chills the enthusiasm of speculators.

Rising prices are accompanied by decreasing exports and

increasing imports. Foreign buyers are unwilling to pay the advance, and find it profitable to purchase elsewhere. Foreign sellers discover that the higher scale of prices gives them a surplus above transportation charges on some new classes of goods.

If prices were dependent only upon the mathematical principles of demand and supply, an equilibrium would soon be established among the price-scales of the various commercial nations, disturbed, indeed, by variations in crops, mines, wars, pestilences, etc., but always, like water, seeking its level, and not under the control of any broad tide-like oscillations. But, owing to the workings of the instinct of anticipation, the upward movement of prices in the country we are considering has acquired momentum.

The public is convinced that "prosperity" has come to stay, and it is a curious fact that in the minds of the vast majority the idea of prosperity is inseparably connected with advancing prices. At least nine men out of ten are natural optimists. If it were not for that fact, civilization would make slow progress; for the one permanently successful enterprise rises out of the ashes of nine failures. Stock-brokers will tell you that 90 per cent. of their customers are "bulls."

Some years have passed since the last panic, and the painful lesson then impressed upon the public mind has become dimmed by lapse of time. From being over-cautious during the period of depression, the people in general have now swung to the opposite extreme, and have become over-confident. The higher prices go, the more speculation increases, the more ready is the buyer of goods to pay a slight advance, and the less urgent is the seller to dispose of stocks on hand. *Entrepreneurs* everywhere are inclined to "branch out," to put their profits into the enlargement of their business in a manner similar to "pyramiding" in the stock market.

Even the consumer usually has on hand at this period more goods than he had during the preceding depression. The farmer has considerable supplies of grain. "Times are good," he says, so that there is little risk in carrying it, and prices are likely to be higher. The merchant is having a lively trade, and is well stocked up. The *entrepreneur* has a quantity of

raw material on hand, to forestall delays, and more contracted for. He also has a considerable stock of finished goods, for which he anticipates an easy sale. Investors own stocks and other property bought at high figures. Every one is speculating, consciously or unconsciously, seeking to anticipate the expected continuance of good times and high prices; and nearly every one is "loaded" with goods.

Real estate is the last to "boom," because great activity in building operations cannot prevail until the people have accumulated sufficient funds to pay for new and better accommodations. Speculation in land often runs to absurd extremes, so that large sums are paid for the "option" on a property for a specified time,—agreements exactly equivalent to "privileges" on the stock or produce exchanges. Such a condition of the real estate market is apt to mark the culmination of a period of prosperous trade.

Decreasing exports and increasing imports soon result in an outward movement of money to pay the balance. Since sales of goods to other nations lessen the quantity at home and purchases abroad increase domestic supplies, this shifting in foreign trade causes an enlargement of stocks on hand. A nation which sells less and buys more, without any corresponding immediate decrease in production, must accumulate; and exports of gold are the visible sign of this accumulation.

The most important influence of gold shipments, however, is in causing the shrewdest class of business men to begin selling their least desirable property and stocks of goods. It is a maxim among such that there is a time when it pays better to allow money to lie idle than to invest it in any other form of property. When the rise in prices began, these men turned their money capital into goods so far as practicable. They now fear falling prices, and therefore turn their goods into bankable funds. To put it in another way, far-sighted men buy money, because that goes up when everything else goes down. As yet they are content to leave it in the banks, where interest is paid on it, while at the same time it appreciates through declining prices.

When the ablest business men thus dispose of their property, they must necessarily sell it to those less keen in antici-

pating and therefore, as a rule, less wealthy. The general public has at that time no more expectation of falling prices than it had of a rise during the period of depression. The people are confident, even enthusiastic, and relatively prosperous. Consequently, the shares of many companies, previously held chiefly by a few wealthy men, are found to have become distributed among a great number of smaller owners, and in many instances a considerable portion are held on "margin." Shrewd *entrepreneurs* get rid of stocks on hand, with the result that those not so shrewd are left with an extra quantity. Everywhere property is passing from those who know to those who do not know, and from those who own to those who hold largely on credit. A sells property to B, and puts the money in the bank. The bank lends money to B with which to pay for the property.

As the number of those who wish to turn goods into money increases, it is observed that prices are showing irregularity and a spasmodic tendency to decline. At first the majority of the public expect an early recovery and hold on, while those who are already overloaded grit their teeth and borrow more money. But the desire to liquidate spreads like ripples from a stone dropped into a pool. The idea that it is a time to sell rather than buy or hold property gradually penetrates to successively lower grades of business sagacity. The pressure of offerings increases as prices yield, and some of the more extensive borrowers find their credit approaching exhaustion.

Eventually, a point is reached where the keenest capitalists begin to fear an epidemic of failures and consequent embarrassment of the banks. At such a time the actual possession of cash is of far more value to the manager of extensive enterprises than any interest obtainable from the banks, as it protects him against every possibility and ramification of failures, gives him ready money for use in his business at a time when that blessing is enjoyed by few, and enables him to loan to his less far-sighted associates at exorbitant rates.

With conditions as above outlined, the attempt to accumulate cash, even by a comparatively small number of wealthy men, will precipitate a panic. The withdrawal of twenty or thirty millions of currency from New York banks, for ex-

ample, would be sufficient to cause "tight money" and a brisk calling of loans. If underlying conditions were sound, such a contraction would be merely an incident; but when a great number of firms are in unstable equilibrium, as it were, each leaning upon the others by means of intermingled credits, the collapse of any one pulls down more.

To complete the illustration given a few paragraphs back: A sells property to B, and puts the proceeds in the bank. The bank lends money to B with which to pay for the property. A next withdraws his money from the bank in cash, thus compelling the bank to recall its loan from B. B is then forced to sell the property back to A at whatever price A is willing to pay for it.

Stated in this personal fashion, it would appear that A had acted very meanly in the matter; and it is that view which led some to charge the capitalist class with producing the panic of 1893 by conspiracy. In point of fact no such agreement is possible under present conditions, though one great financial interest might follow another's example. Each individual is merely seeking to protect himself from apprehended dangers. To withdraw cash at such a period is clearly unpatriotic, but for any one individual to refuse to do so on that ground might result in loss to himself without averting disaster from others.

If we let A represent a class, those shrewd or lucky enough to prepare for liquidation and panic, and B another class covering all the rest of the property-owning population, then the above illustration is an exact epitome of the descending portion of the trade cycle.

A rise in the money-value of goods is slow and pleasant; but the advance in the goods-value of money—the fall of prices—is short, sharp, and painful. Goods accumulated gradually in the inspiration of hope are thrown recklessly overboard under the pressure of bankruptcy or the spell of fear. It is the survival of the strongest intellectually and financially, and the decline and subsequent depression will not end until the weak are thoroughly eliminated. Moreover, the hoarding of currency in time of panic so lessens the circulating medium as seriously to interfere with the ordinary processes of exchanging goods. It is a periodical breakdown of the

social machinery, and one for which our economic and political engineers have so far been unable to suggest any adequate remedy.

The credit system is responsible for both the extent of the advance in prices and the violence of the decline, and is the sole cause of the panic which results from the hoarding of cash, as without credit there would be no fear of bank failures; but it is not the cause of that seesaw movement between goods and money which is termed the trade cycle. The effort to anticipate higher prices would still exist if credit were unknown.

Wheat affords an excellent illustration of the effect of speculative sentiment on prices apart from the influence of demand and supply proper. The per capita consumption of that grain does not appreciably increase in prosperous times, as whatever tendency there may be to an enlarged use in some directions is fully balanced by the more extensive substitution of meat and vegetables among wage-earners. Yet it is a well-known fact that, other things being equal, the price of wheat averages considerably higher during periods of activity than in times of depression.

The reason why the trade cycle is a modern phenomenon is immediately evident. It is the growth of public intelligence which has led to the well-nigh universal development of the attempt to foresee and anticipate the effect of future events on prices. A popular novelist represents one of his characters as suggesting the following modification of the Golden Rule: "Do unto others what they would like to do to you, and do it first." The effort to speculate increases with the growing "smartness" of the people.

It would seem that some of the time spent in discussing the periodicity of crises might better have been employed in productive labor. Since the beginning of railway transportation there have been four great panics in the United States,—1837, 1857, 1873, and 1893. There were also intermediate reactions in trade in 1847 and 1884. The Civil War so deranged industrial conditions between 1857 and 1873 as to overshadow other influences. The shortening up of that tidal period was apparently due to the immense expenditures of the government and

the inflation of the currency, which acted as a powerful stimulus to advancing prices. It seems self-evident that the duration of a trade cycle must depend largely upon the special conditions which tend to retard or accelerate the action of natural forces.

It is plain that the development of the "trust" system and the consequent centralization of industry may have an important effect in lessening the severity of periods of liquidation and panic, but the full discussion of that question would take us beyond the limits of this article.

In conclusion, the primary cause of the trade cycle is the effort of buyers and sellers to anticipate a rise in prices. This produces a fictitious enlargement of demand beyond real consumptive requirements, and finally results in the accumulation of considerable stocks of goods. At the same time, prices pass above the average international level. Buyers at these figures are necessarily less shrewd and, on the average, less wealthy than sellers, so that the first important unfavorable development finds much property in weak hands and causes a disastrous decline. Price fluctuations are increased in extent and severity by the credit system.

G. C. SELDEN.

CHICAGO, July 30, 1901.

RECENT PUBLICATIONS UPON ECONOMICS.

Chiefly published or announced since November, 1901.

An asterisk prefixed to a title indicates a second and more detailed notice of a book announced in a previous number.

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